



**FACULTY OF AGRICULTURAL SCIENCES & ALLIED INDUSTRIES**

Botanical name : *Psidium guajava*

Family : Myrtaceae

Chromosome No :  $2n=22$

- GUAVA (Amrud) is one of the most common fruits in India.
- It ranks 4th in area and production after mango, banana and citrus.
- It is a very hardy sub-tropical plant, prolific bearer.
- In India, it is commonly called as “poor man’s apple” widely naturalized in the country.
- Allahabad has the reputation of growing the best guava in the country as well as in the world.

## Composition and Uses

The fresh fruits are very rich in vitamin C (100-260 mg/100g pulp). Vit-A, B2, and minerals like Calcium, P, acidity 2.4 per cent, carbohydrates 9-10 per cent, TSS-13 per cent, pantothenic acid, riboflavin, thiamin and niacin, also rich source of pectin.

- The fresh ripe fruits are used as table/salad fruits.
- Fruits are rich in pectin. The best quality jelly can be prepared; fruits can be canned in sugar syrup or made in to fruit butter, juice preparation and in ice-creams.
- The leaves yield a dye and is used in dyeing industry and also has medicinal values for curing diarrhea.

## Origin and Distribution

- A native of tropical America, guava was spread rapidly throughout the world’s tropics by the Spanish and Portuguese.
- The major guava producing countries are South Asian countries, the Hawaii Islands Cuba and India.
- In India it is grown in 1.30 lakh hectares in Uttar Pradesh (largest area and production), Bihar, M.P, Maharastra and Andhra Pradesh.

## Soil and Climate

- Being very hardy, is grown successfully in wide range of soil like light sandy loam, clayey, deep, rich alluvial with the pH of 4.5- 8.2.

- It is the fruit crop of sub-tropical region, the young plants are susceptible to drought and cold.
- The trees are very hardy and can withstand heat and prolonged drought.
- A cool winter induces heavy fruiting and produces good quality fruits.
- The rainfall of 100cm with uniform distribution is ideal for production.
- The optimum temperature lies between 23-28°C and can be grown up to 1500m above mean sea level.

### Species and Cultivars

There are more than 150 species available in guava and some of the important species are

***Psidium. guajava***- It is the commercially cultivated species, rest of them do produce fruits but small size, inferior quality and with high acid content.

- ***P. guineense*** – Guinea guava – has small fruit with poor quality.
- ***P. guajava var. aromaticum***- small scented fruits.
- ***P. pomiferum*** – Fruits are round.
- ***P. pyriferum***- Fruits are pear shaped.
- ***P. cattleianum***- The strawberry guava with round red fruits.
- ***P. friedrichsthalianum***- Chinese guava with small and globose fruits having high acid content and resistant to wilt.

### Varieties

#### **L-49 (Lucknow-49)**

- It is prolific bearer, greenish yellow with milky white sweet pulp and rough surface.
- Shell is fairly thick, contains fairly soft few seeds in inner portion of pulp.
- Since the number of seeds are less, keeping quality is medium, it is very popular in Maharashtra and Andhra Pradesh.
- It is suitable for table purpose and yields about 25t /ha.

#### **Allahabad Safeda**

- This is the most famous variety grown in Uttar Pradesh for table purpose.
- Tree is medium in height (5.8-6.5m) with vigorous branching and dense foliage.

- Fruits are medium in size (180g), round in shape with few seeds.
- Fruit is white fleshed with good keeping quality.

**Chittidar:** The Chittidar is similar to the Safeda except that, it has many pinkish red dots of the pinhead size on the surface of fruit

### Red Fleshed

- Tree attains 3-5m height.
- The branches are spreading with roundish oval fruit, which has yellowish skin with pink colour flesh.

### Hybrids

#### Arka Mridula

- This hybrid was obtained by crossing of Seedless x Allahabad safeda. Plants are semi-tall in nature and spreading.
- Fruits are round in shape and weigh about 180g.
- Skin is yellow in colour and smooth.
- Flesh is white in colour.
- The TSS is around 12° Brix.
- Fruits are soft seeded and have a good keeping quality.
- It is good for processing due to high contents of pectin (1.041%).

Other hybrids released from Fruit research station, Sangareddy, Andhra Pradesh are

- Safed jam- Allahabad safeda X Kohir
- Kohir safeda- Kohir X Allahabad safeda

### Propagation

Commercially guava is propagated by grafting /Air layering/Ground layering.

### Land Preparation

#### Raising of seedlings

- Rootstocks are raised from the seeds extracted from healthy fruits and stored for 100 days by treating with ferulic acid at 10-30 Molar concentration.
- Potassium nitrate also used at 1 per cent to prolong storage of seeds.

- The seedlings will be ready for grafting in 45-60 days after sowing.
- The layers should be treated with 1BA 10,000 ppm for better rooting.

## Planting and Irrigation

### Planting

- Planting is done during monsoon at a spacing of 6m X 6m by opening 90cm<sup>3</sup> pits provided with 30-40 kg FYM, dried leaves and 1 kg SSP.
- After planting they are supported by stakes.

### Irrigation

- Immediately after planting, plants are watered.
- During summer and winter season orchard is irrigated at an interval of 4-6 and 10-15 days respectively.

## Nutritional Management

### Manuring

- The tree should be provided with 25kg FYM/plant, at the time of planting, the fertilizer dosage should be given based on the age of the plant.
- Following are the fertilizers recommended in major guava growing states of India.

State	N (g/plant/ year)	P (g/plant/ year)	K (g/plant/ year)	FYM (kg/plant/ year)
Karnataka	300	120	150	25
Maharastra	600	300	370	12-15
Andhra Pradesh	210	160	300	60
Tamil Nadu	1000	1000	1000	50
Uttarpradesh	350	250	350	----

- Fertilizers are applied in 2 splits i.e. half of N and full of P and K during bahar treatment and remaining half of N 1-1½ month after first application.

- Foliar application of urea (3 per cent) along with Calcium, Phosphate and Muriate of Potash (Kcl) at 1 per cent could increase the yield.
- The deficiency of micronutrients such as Zn and B are rectified by spraying with Znso4 (0.3 per cent) and Boron – Boric acid (0.4 per cent) before flowering.

#### **Bronzing (Fatio disease):**

- The leaves turn to pale or purple color, small size leaves, sparse flowering, death of growing tips, ultimately plant dies.
- It may be due to the deficiency of NPK, Zn, Mg and low pH, spraying of 0.5 per cent DAP and Znso4 during Oct-Nov at weekly intervals.

#### **Irrigation:**

- Immediately after planting, orchard is irrigated.
- During summer and winter season orchard is irrigated at an interval of 4-6 and 10-15 days respectively

#### **Intercropping**

During pre-bearing age, some of the fruits and vegetables can be taken as the remunerative crops i.e., Leguminous vegetables or green manuring crops are grown during first 1-2 years.

#### **Weed Management**

- Weed is a problem at the early stage of growth, for conservation of moisture, proper utilization of nutrients as well as for effective control of pests and diseases weed free environment is essential.
- Integrated weed management programme should include growing of cover crops, use of herbicides, inter cropping and hand weeding where ever necessary.

#### **Training and Pruning**

- Training is done primarily to give form to the tree. For development of a strong framework, the first 60 to 90 cm from base of the trunk should be cleaned followed by 4 to 5 scaffold branches at an interval of 20-25 cm. When the plants attained a height of about 1.5m to 1.8 m, it is headed back to make the center open.
- In some parts of India (Maharashtra and South Bengal), the branches are bent down ward and tied to each other. Thus forcing the dormant buds to grow. This results in increased yields. The trees are rarely pruned in North India, but light annual pruning after harvesting to promote vegetative growth and flowering is desirable. All dead, diseased, crowded growth and suckers sprouting from the base and

sides of the framework are pruned back annually. Pruned trees give larger fruits and early ripening.

## Flowering and fruiting

### Flowering and fruiting

- Guava tree flowers throughout the year, but the peak flowering is observed in 2 season, rainy crop (April-May) and winters crop (Aug- Sept).
- Flowers are produced in leaf axils or in cyme the period of flowering varies from 25-45 days.
- Honey bees are the pollinators.

### Flower regulation

- Bahar treatment expand, root exposure, with holding water and also deblooming the rainy season crop due to insipid taste of the fruits and inferior quality.
- So winter crop is generally desirable.

### Fruit set

- Only 35-50% fruits are carried to maturity though initially 80-86% fruit sets.
- In seedless variety, it is as low as 6 per cent to improve fruit set, GA3 at 200ppm.
- Fruits take 105-140 days to mature from fruit set.
- Spraying GA3 at 1000-8000 ppm is suggested to improve fruit set.

## Harvesting and Yield

### Harvesting

- Guava, being a climacteric fruit, it ripens after harvesting; the fruits are harvested throughout the year (except during May and June) in one or the other region of the country.
- However, peak harvesting periods in north India are August for rainy season crop, November-December for winter season crop and March April for spring season crop.
- In the mid climatic conditions of other parts of the country, the peak harvesting periods are not so distinct.

- Change in colour of fruits from dark green to pale green is the indication of maturity, the fruits are harvested at their full yellow but firm for local market, whereas half yellow fruits should be picked for distant markets.
- The fruits are harvested selectively by hand along with the stalk and leaves.

### Yield

- The tree reaches its peak bearing stage within fifteen to sixteen years after planting a mature tree yields about 90-150kg fruits or 10-15t/ha.
- Sardar variety gives about 25t/hectare.

### Post Harvest Handling and storage

- Because of their perishable nature, guavas are disposed off immediately after harvesting in the local market and a very small quantity is sent to distant market, they are not kept in cold storage.
- However, shelf-life of guava can be extended up to 20 days by keeping them at low temperature of 5°C and 75-85% relative humidity.
- It can also be stored for about 10 days at room temperature (18-23°C) in polybags, providing a ventilation of 0.25%.

### Pests and Diseases

#### Pests

1. Fruit fly- *Chaetodacus spp*- It is severe during rainy season crops
2. Mealy bugs- *Cryptolems spp*.

The other pests causing problems to this crop are scale insects, Tea mosquito, shoot & bark borer.

#### Diseases

1. Guava wilt- *Fusarium spp*.
2. Anthracnose- *Colletotrichum psidii*- It is also severe during rainy season crops
3. Fruit canker- *Pestalotia psidii*.
4. Cercospora leaf spot- *Cercospora sawadal*