

Scientific Cultivation of Papaya

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Introduction

Papaya (*Carica papaya* L) is widely grown in the tropical and subtropical region in about 57 countries across the world India, Brazil, Indonesia, Nigeria and Mexico are the leading countries in papaya production. It is widely grown in the states of Andhra Pradesh, Gujarat, Maharashtra, Karnataka, Madhya Pradesh, West Bengal, Chhattisgarh, Tamil Nādu, Assam, Kerala and has emerged as a very remunerative commercial crop because of its early yields, high productivity, good nutritive value and availability throughout the year. It is grown for both fresh fruit and for papain extraction. Ripe fruits are very rich in carotenoids, precursors of vitamin A.

Types of varieties

Papaya being cross pollinated and seed propagation has high degree of variability. In India a large number of papaya varieties are cultivated in the commercially cultivated papaya varieties are of two types. They are Dioecious that produce separate male and female plants pants, Gynodioecious that reduces female and hermaphrodite plants. The Gynodioecious varieties are more preferred as both female and hermaphrodite plants. The fruits produced from hermaphrodite flowers are long and fruits from female flowers are around.

Improved Gynodioecious varieties are Arka Surya, Arka Prabhath, Red lady-786, Red sun dwarf etc.

Improved dioecious varieties are Pusha dwarf, Pusha nanha, Ranchi dwarf etc

Soil: Well drained medium black to red loamy soil with a pH range of 6.5 to 7.0 with regular enrichment of organic amendments are ideal for papaya cultivation.

Climate: it is a tropical plant; it requires high temperature and adequate moisture in the soil. It is high sensitive to frost. Summer temperature between 38 to 48⁰C and where winter temperature does not fall below 5⁰C are ideal for growth, temperature below 10⁰C retards growth.

Seed: 25 to 30g seeds of gynodioecious varieties require for 1 acre area.

Seed Treatment: sweets are treated with GA 100 PPM solution for 8 hours or cabendazim @ 2 grams per kg seeds.

Sowing: sown in perforated polythene bags measuring 20x15cm size with 150-gauge thickness, filled with equal proportions of enriched FYM, soil sand, and cocopeat. Sown at shallow deep (1/2 inch). Best time is June to October.

Transplanting: seeds germinate in about 2 to 3 weeks' time and are ready for transplanting at 45 to 60 days of sowing. In the main field pits of 45x45x45cm are dug at the space of 2 x 2 meter which should be filled with soil and FYM and 5g/pit fipronil insecticide.

Fertilizer application: Recommended fertilizers schedule for papaya (g/plant)

Month after planting	N	P	K
1	50	50	50
3	50	50	50
5	50	50	50
7	50	50	50

Micronutrients: Boron deficiency is very common in papaya. It is characterized by distortion of young leaves, brittle and claw-like fruit set is severely reduced, poor development, uneven ripening, latex exudation from surface of immature fruits, fruits are hard and not easy to get ripe.

Control measures include application of 15 to 20g Borax per plant along with other fertilizers at the beginning of dry season and 20g at planting. Spray 0.25% Borex or solubor on the leaves at the beginning of dry season at 4 to 6 weeks interval.

Intercropping: legging and short duration vegetables can be grown up to six months. Avoid cucurbitaceous vegetables. Papaya can be grown as an intercrop in fruits plantation of mango, lichi, sapota, coconut plantation, where there is no said in the inter-spaces. Maize can be grown as a border crop.

Diseases:

Papaya mosaic: Mosaic is major disease of papaya this disease also known as ring spot disease of papaya, papaya distortion mosaic, mild mosaic, leaf reduction. Plants of all ages are susceptible. Dark green water soaked develop on petioles and stems. Mottle and mosaic patterns of varying severity develop on leaves that often have a ruffled appearance. Dark green sunken rings that develop on fruit of affected plant. Fruit from affected plant have poor flavor, a leathery appearance.

Management: going off border frocks turo of caesarea for castor 50 days before planting of papaya rocking and removal of early infected plants as and when noticed helps to control the disease incidence, spray of monocrotophos @ 1 ml per litre water and growing tolerant or resistant varieties.

Stem root or foot root: water-soaked patches on the steam at ground level, which enlarge and girdle base of the stem develop. The affected tissues turn brown that black and rot. The terminal leaves turning yellow, wilt and drop. Fruits if formed also shrivel and drop off. The entire plant topples and die because of disintegration of parenchymatous tissue.

Management: seed treating with captain or chlorothalonil (Kavach) should we done before sowing the seeds. Healthy nursery plants should be planted and crop rotation with nonhost crop should be followed. Soil drenching with mancozeb+metalexyl 0.2% at bio monthly interval provide effective control of the standing crop.

Damping off: Pre emergence damping off: characterized as toppling of the growing tip before it comes out of the soil.

Post emergence damping off: seedlings show pale withering and banding systems near the ground level with the several girdling of the stem tissue. Such effected seedlings suddenly topple down.

Management: seeds for raising nursery should be obtained from healthy fruits. Water stagnation and low-lying areas should be avoided for nursery. Seeds should be treated with cabendazim, captan, Thiram @ 2 g/kg seeds. Drenching of nursery chlorothalonil (Kavach) 0.2% or Vitibex 0.1% or cabendazim 0.1% should be done.

Anthracoze: Disease can attack fruits petioles, leaves, floral parts etc. Water-soaked spots first appear as brown superficial discoloration of the skin and then develop into circular, slightly sunken areas 1-3cm diameter. Gradually the lesions coalesce and sparse mycelial growth often appears on the

margins. Under humid conditions encrustation of Salmon pink Strauss spores often arranged in a concentric pattern develop on the surface of older spots. Fruits later turn dirty brown and rot. infection at early stages results in mummification and deformation of fruits whereas at mature stage rot develops.

Management: Infected leaves should be removed and destroyed. Spraying of mancozeb @ 0.2% or chlorothalonil @ 0.2% or cabendazim @0.1% at 15 days interval provides effective control.

Powdery mildew: small circular powdery patches developed on both the sides of leaves and on stem of young seedlings. These patches gradually extend, coalesce and cover the entire leaf surface. Badly infected leaves curl, dry, hang down and ultimately fall off. young seedlings may die severe disease attack. Sometimes in severe cases the pathogen attack fruits also.

Management: The disease is effectively controlled through the spraying of sulphur 0.3% when atmospheric temperature is below 30°C. Application of systemic fungicide (cabendazim 0.1% or thiophanate-methyl 0.1% at monthly interval is much more effective.

Nematode: application of carbofuran 25g/plant in the main field and use of bio control agent.

Important points to remember:

- Provide ideal condition for seed germination.
- Rise seedlings under protected conditions.
- Use Healthy disease-free and tolerant seedlings for planting and avoid using overgrowth seedlings.
- Use well drained loamy soil rich in organic matter.
- Plant of seedlings on raised pits (10 to 15 cm height).
- Provide sufficient slope to avoid water stagnation.
- Avoid planting during winter as the seedlings are sensitive to frost.
- Avoid planting in shade as it leads to excess vegetative growth.
- Provide sufficient irrigation for continuous growth, good fruit set and development.
- Apply manures and fertilizers at time to continuous crop growth and fruit production.
- Apply foliar spray of micronutrients at regular intervals.
- Use recommended chemicals for control of pest and diseases.



View of Papaya field



Suggest control measures of pest and disease to farmer



Diagnose pest and disease of papaya at farmer's field



Full bearing fruits of papaya plant