



## Pest and Disease Management in Amrapali Mango Orchards

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Amrapali mangoes, a popular hybrid variety known for their rich flavor and high-quality fruit, face numerous pest and disease threats that can significantly impact their growth and yield. Effective pest and disease management is crucial to maintaining healthy orchards and ensuring the production of premium-quality fruit. This article reviews the key pests and diseases affecting Amrapali mango orchards, including mangooppers, mealybugs, fruit flies, powdery mildew, anthracnose, and bacterial black spot. It discusses integrated pest management (IPM) strategies, such as cultural practices, biological control, and the judicious use of chemical treatments. Additionally, the article highlights advanced techniques like drone monitoring, smart irrigation, and genetic resistance, which contribute to efficient pest and disease management. By adopting a combination of traditional and modern practices, mango growers can enhance orchard health, optimize fruit yield, and ensure sustainable production of Amrapali mangoes. Regular monitoring, early detection, and balanced management strategies are essential for minimizing the impact of pests and diseases and maintaining the quality of this prized mango variety.

### Introduction

Mango orchards, particularly those growing high-value varieties like Amrapali, are susceptible to a range of pests and diseases that can significantly affect both the quality and yield of the fruit. Effective pest and disease management is critical to ensuring healthy trees and successful harvests. This article outlines the common pests and diseases that affect Amrapali mangoes and offers strategies for managing them.

### Common Pests in Amrapali Mango Orchards

Several pests pose a threat to Amrapali mango trees, especially during the flowering and fruit-setting stages. These pests damage trees by feeding on leaves, fruits, and sap, and can sometimes carry diseases that exacerbate damage.

**a) Mango Leaf Hopper (*Amritodes atkinsoni* L. or *Idioscopus clypealis*):** Mangooppers are one of the most destructive pests in mango orchards. The adults and nymphs feed on the sap of mango leaves and inflorescences, causing wilting, leaf curling, and reduced fruit set. The hopper is also a vector for various fungal and viral diseases, further compounding the damage.

#### Management:

- mass collection of nymphs and adults by light traps.
- first spray before flowering on barks of branches and two more spray when buds begun to support with 0.04% dimethoate, 0.05 % quinalphos or 0.1% carbaryl.

**b) Mango Mealybug (*Drosicha mangiferae*):** The mango mealybug feeds on the sap of mango trees and excretes honeydew, which can lead to the growth of sooty mold. Infestation can weaken the tree, reduce fruit quality, and promote the growth of fungal diseases.

Additionally, mealybugs can transmit harmful viruses.

**Management:**

- Raking of soil around the base of infested trees so that eggs masses get exposed to sun and may be killed by heat in the month of May and June.
- Application of sticky band, around the tree trunk so as to check nymph from crawling up the tree (4 parts castor oil + 5 parts resin) ½ to 1 metre above the ground level during second week of December. It remains effective for a period of two weeks after which it should be repeated.
- Release Australian ladybird beetle, *Cryptolaemus montrouzieri* @ 10/tree
- Once the pest reaches the top of the plant, control becomes rather difficult.
- Spraying of insecticides: Dimethoate 30 EC 2.5-3.3L or malathion 50 EC 1.5 -2.0 L or chlorpyrifos 20 EC 3.0 –4.0 L

**c) Fruit Fly (*Bactrocera dorsalis*):** Fruit flies are notorious for infesting mangoes during their ripening phase. Female fruit flies lay eggs inside the fruit, and the larvae feed on the flesh, causing the fruit to rot. This results in a significant loss of crop quality, especially for export markets where appearance is crucial.

**Management:**

- Avoid infestation by early harvesting of mature fruits.
- Sanitation-daily removal and destruction of fallen, affected fruits.
- After harvest dip the fruit in 5% NaCl solution for 60 min to destroy egg.
- Monitoring fruit fly population in orchids by using methyl eugenol traps.
- Ploughing round the trees during winter to expose and kill pupae

**d) Mango Stem Borer (*Batocera rubus L. or Batocera rufomaculata*):** The grubs bores and tunnels into stem as a result dry up and mass of refuge exclude from bored holes. Tree may die in case of sever infestation.

**Management:**

- Cut and destroy the infested branches with grubs and pupae within.
- Inject 4 ml of methyl patathion 50 EC mixed with 1 liter of water into the holes and plug it with mud.

### Common Diseases in Amrapali Mango Orchards

Amrapali mangoes are susceptible to various fungal, bacterial, and viral diseases that can negatively affect tree health and fruit yield.

**a) Powdery Mildew (*Oidium mangiferae*):** Powdery mildew is a fungal disease that affects the leaves, flowers, and young fruits of mango trees. It appears as white, powdery patches on the affected parts, leading to reduced photosynthesis, early defoliation, and stunted fruit growth. Severe infections can lead to a significant reduction in fruit yield.

**Control:**

- Alternate spraying of Wettable sulphur 0.2 per cent (2 g Sulfex/litre)
  - Tridemorph 0.1 per cent (1 ml Calixin/litre) and Bavistin @ 0.1 % at 15 days interval are recommended for effective control of the disease.
  - The first spray is to be given at panicle emergence stage.

**b) Anthracnose (*Colletotrichum gloeosporioides*):** Anthracnose is a common fungal disease that affects mangoes, especially during the ripening stage. It causes dark, sunken lesions on the fruit, reducing its marketability. It can also affect flowers and young shoots, leading to poor fruit set and tree damage.

**Control:**

- The diseased twigs should be pruned and burnt along with fallen leaves.
- Spraying twice with Carbendazim (Bavistin 0.1%) at 15 days interval during flowering controls blossom infection.
- Spraying of copper fungicides (0.3%) is recommended for the control of foliar infection.

- Postharvest disease of mango caused by anthracnose could be controlled by dip treatment of fruits in 0 Carbendazim (0.1%) in hot water at 52 C for 15 minutes.

**c) Die Back (*Botryodiplodia* (*Lasiodiplodia*) *theobromae*) :** Die back is one of the serious diseases of mango. The disease on the tree may be noticed at any time of the year but it is most conspicuous during October-November. The disease is characterized by drying of twigs and branches followed by complete defoliation, which gives the tree an appearance of scorching by fire. Initially it is evident by discoloration and darkening of the bark. The dark area advances and extends outward along the veins of leaves. The affected leaf turns brown and its margins roll upwards. At this stage, the twig or branch dies, shrivels and leaf falls. This may be accompanied by exudation of yellowish brown gum.

**Control:**

- Pruning of the diseased twigs 2-3 inches below the affected portion and spraying Copper Oxychloride (0.3%) on infected trees controls the disease.
- The cut ends of the pruned twigs are pasted with Copper Oxychloride (0.3%)

**d) Bacterial Black Spot (*Xanthomonas campestris*):** Bacterial black spot causes dark, water-soaked lesions on leaves, flowers, and fruits. The disease can reduce the tree's photosynthetic capacity and lead to premature fruit drop. It also makes mangoes susceptible to secondary infections from fungi.

**Control:**

- Three sprays of Streptocycline (0.01%) or Agrimycin-100 (0.01%) after first visual symptom at 10 day intervals and monthly sprays of Carbendazim (Bavistin 0.1%) or Copper Oxychloride (0.3%) are effective in controlling the disease.

## Pest and Disease Management Strategies

Effective management of pests and diseases in Amrapali mango orchards requires an integrated approach, combining cultural practices, biological control, and chemical treatments.

### a) Cultural Control Practices

- **Pruning:** Regular pruning of dead or infected branches helps improve air circulation and sunlight penetration, reducing the humidity that promotes fungal growth.
- **Proper Irrigation:** Overwatering can create conditions favorable for root rot and fungal growth. Ensure proper drainage and use drip irrigation to maintain optimal moisture levels.
- **Sanitation:** Remove fallen fruit, leaves, and branches, as these can harbor pests and pathogens. Destroying infected plant material helps limit the spread of disease.
- **Crop Rotation and Intercropping:** Growing other crops between mango trees can help disrupt pest life cycles and reduce pest pressure.

### b) Biological Control

- **Natural Predators:** Introduce or encourage natural predators like ladybugs, which feed on aphids and mealybugs, and parasitoid wasps that target mango hoppers and fruit flies.
- **Biological Pesticides:** Use bio-pesticides like *Beauveria bassiana* or *Trichoderma spp.*, which are effective against fungal diseases like powdery mildew and anthracnose.

### c) Chemical Control

- **Insecticides and Fungicides:** Use appropriate chemical treatments for pest and disease control. For mango hoppers, apply systemic insecticides like imidacloprid. For fungal diseases like anthracnose, use fungicides containing copper or sulfur.
- **Pesticide Rotation:** To prevent resistance, rotate between different classes of insecticides and fungicides.

**d) Integrated Pest Management (IPM):** IPM combines cultural, biological, and chemical control methods in a way that minimizes harm to the environment and reduces the use of chemical pesticides. Regular monitoring, early detection, and intervention are crucial to

preventing pest outbreaks. Trap crops, pheromone traps, and visual inspections can help in identifying pest populations early.

### Conclusion

Effective pest and disease management in Amrapali mango orchards is essential for maintaining healthy trees and producing high-quality fruit. By integrating cultural practices, biological control, and careful use of chemicals, orchard managers can significantly reduce the impact of pests and diseases. Additionally, employing an integrated pest management approach ensures the sustainability of mango farming while maintaining fruit quality, making Amrapali mangoes a lucrative crop for farmers.

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