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Important Diseases of Papaya and its Management

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INTRODUCTION

The botanical name for papaya is *Carica papaya* L. It is a member of the Caricaceae family, which has 48 species that are known to exist. Of these, *Carica papaya* L. is the only species that is cultivated for edible fruits. Growing throughout the world's tropical and subtropical regions, papayas are one of the most significant and tasty fruit harvests. From its beginnings in tropical America, it has spread to nearly every region of the tropical world. Its quick development, abundant production, extended fruiting season, and excellent nutritional content have all contributed to its rising popularity. Furthermore, it has been employed in the processing of fruits, vegetables, and papain in its immature state. Now, it was a very lucrative harvest. It is high in nutrients and simple to cultivate. Disease control is one of the biggest problems papaya producers have, although guava growing is not without its difficulties. We will go into further detail about common guava diseases, their symptoms, and practical preventative measures.

Powdery Mildew (*Odium indicum*, *Odium caricae*):

Symptoms:

The illness manifests itself as pods and foliage. The earliest signs of infection on the leaves are little, slightly darker patches that eventually turn into powdery white spots. The whole leaf surface is covered in these enlarging dots. Before dropping, severely diseased leaves may get chlorotic and twisted. Small and deformed fruits are the result of the disease. Temperatures between 24 and 26°C and high humidity (80–85%) encourage the growth of powdery mildew on papaya.

Powdery Mildew of papaya

Management:

As soon as the disease symptoms are observed dusting Sulphur (30 g/10 litres of water) or spraying Calixin 75 EC (5 ml/10 litres of water) at 15 days interval helps to control the disease.

Leaf- Blight (*Corynespora cassiicola*):

Symptoms:

The disease severely deteriorates leaves. Little, discolored lesions that are sporadically distributed on the leaves are the initial signs of the disease. These dots start off haphazard, get bigger, and take on a brown to grey hue. The specks are surrounded by a zone of pale yellow. Large sections of the leaf are covered by a number of lesions that combine, and in cases of severe infection, the entire leaf dies. There is a noticeable drop in the yield.

Management:

Dithane M-45 (0.2%) can be sprayed on the illness beginning when symptoms start to show.

Damping-Off (*Rhizoctonia solani*)**:**

Symptoms:

Young seedlings are affected by this disease At or slightly above soil level, lesions are visible on the stem. Plant death occurs when the stem gets swollen and wet.

Management:

When planting, utilize well-drained soil, and avoid over-irrigating the crop. Before planting, the seeds have to be treated with a fungal culture of Trichoderma viride (3–4 g/kg of seed) or captan (3 g/kg of seed) in order to safeguard the just emerged seedlings.

Foot Rot of Papaya (*Pythium aphanidermatum*):

Symptoms:

Papaya illness is quite serious. The onset of wet spots on the stem close to the ground level is what distinguishes it. The tissues inside these quickly growing patches deteriorate and turn dark brown or black as a result of girdling the stem. Plants that are impacted by this fall and eventually die even in the face of intense winds. Only one side of the stem rots and the plants stay stunted if the disease assault is modest. Should fruit develop, it is stunted and distorted. Plant death occurs slowly.

Management:

At the time of planting, apply a mixture of well-decomposed FYM and 15 g/plant of Trichoderma viride to the area surrounding the plant roots. In order to prevent the water from coming into direct touch with the stem, the crop should be watered using the ring technique.

Avoiding water logging of the soil in the case of newly planted areas may help manage the illness. Apply a solution of 2-3 liters of copper oxychloride (3 g/liter) into the soil. The application needs to be done on a regular basis, every 15 days starting from the planting date. The plant has to be sprayed with the same solution at the same intervals while fruit is developing. An additional option is to apply Mancozeb (2.5 g/liter of water).

If an established crop is affected by disease, the affected area should be removed by scraping and using Bordeaux paste or copper oxychloride. One kilogram of copper sulfate and ten liters of water each can be used to dissolve the lime and make the paste. To create a paste, combine the two liquids and shake well.

Three liters of copper oxychloride (3g/litre) should be poured over the base of the plant. The plant should be soaked twice at a 15-day interval with Copper Oxychloride or

Mancozeb at the previously stated doses when fruit is forming.

Anthracnose (*Colletotrichum gloeosporioides*):

Symptoms:

The illness is most noticeable on green, immature fruits. Brown to black depressed patches on the fruits are indicative of the illness. Sunken, wet areas on the fruit are the first signs. Later, as the fungus develops spores, the cores of these patches become black, then pink. The entire apple starts to get wet and mushy underneath the patches. It's also possible to see tiny, asymmetrical water-soaked patches on leaves. Eventually, the color of these patches turns brown.

The symptoms on fruits don't always show up when they're ready to be harvested; they only show up when the fruit ripens. On the fruit surface, brown sunken patches appear first. These spots eventually grow to become water-soaked lesions. The skin underneath the afflicted area gets mushy and begins to rot.

Management: The contaminated fruits need to be taken out and disposed of. As soon as the fruits reach maturity, they should be picked. The illness can be efficiently controlled by spaying at intervals of 15 days using Copper Oxychloride (3 g/liter of water), Carbendazim (1 g/liter of water), or Thiophanate Methyl (1 g/liter of water). Fruits intended for export should be treated with fungicidal wax or hot water.

Papaya Mosaic (virus):

Symptoms: Papaya plants of all ages are susceptible to the disease, although immature plants are more vulnerable. The illness is spread by aphids. The disease's early signs show up on the plant's upper leaves. The size of the leaves has decreased, and blister-like areas of dark green tissue alternate with lamina that is yellowish green in color. The upper leaves stand straight while the length of the leaf petiole decreases. The afflicted plants have a noticeable decline in growth. Water-soaked lesions with a solid center are developed in the fruits carried by diseased plants. These fruits are smaller and longer.

Papaya Mosaic

Management: Keeping the field clean by removing and destroying contaminated plants stops the illness from spreading. Additionally, losses can be minimized by managing the aphid population. Aphid population is efficiently controlled by applying 1 kg a.i./ha of carbofuran at the time of seeding, followed by 2-3 foliar sprays with phosphomidon (0.05%) at 10-day intervals beginning from 15-20 days after sowing.

Leaf Curl of Papaya (Virus):

Symptoms:

The white fly vector that spreads the disease is called Bemisia tabaci. The illness is characterized by severe crinkling, curling, and distortion of the leaves. The young leaves are most impacted. In addition to curling, the leaves also show thickening and vein clearing. The petioles might twist sometimes. In extreme circumstances, the afflicted plant exhibits total defoliation. The impacted plants have reduced fruit output and decreased development.

Leaf Curl of Papaya

Management: The only way to stop the disease's spread is to remove and destroy affected plants. The severity of the infection can also be decreased by monitoring the white fly population. Effective methods to manage the whitefly population include applying 1 kg of carbofuran a.i./ha to the soil at the time of planting and doing four or five foliar sprays of dimethoate (0.05%), Metasystox (0.02%), or Nuvacron (0.05%) every ten days.

Papaya Ring Spot Virus:

Symptoms:

Aphids are the ones who transfer the virus from plant to plant. When it comes to papaya, the young leaves first show signs of yellowing and vein clearing. Subsequently, the leaves exhibit a noticeable yellow speckling, and occasionally, there is significant blistering and deformation of the leaves. There are also dark-green rings and streaks on the stems and leaves.

The symptoms that appear on fruit are what give the sickness its name. Their pattern is a deeper shade of green than the main green color of the fruit and consists of C-shaped marks or concentric rings and dots. Darker orange-brown rings continue to be the symptoms on mature fruit. The age of the afflicted plant determines how much of its vigor and fruit set are typically lost. It also has a negative impact on fruit quality, namely on flavor.

Management: Prompt identification of contaminated plants and their timely removal helps halt the disease's spread. Aphids can be managed by applying carbofuran (1 kg a.i./ha) to the nursery bed at the time of seeding, and then commencing 15-20 days later, applying 2-3 foliar sprays of phosphomidon (0.05%) every 10 days.