



FACULTY OF AGRICULTURAL SCIENCES AND ALLIED INDUSTRIES

**DISEASES OF FIELD&HORTICULTURAL CROPS&
Management 1 PPA - 312**

LECTURE 03

1. NAME OF DISEASE – FOOT ROT OF PAPAYA

Pathogen: Pythium aphanidermatum

Symptoms

- Water soaked patches develop on the stem at the ground level
- Patches enlarge and diseased tissues turn brown and rot
- Because of rotting the basal portion of stem is girdled affecting the upward flow of water and nutrients and weakening the plant
- Internal tissues of bark appear dry and give honey comb appearance
- Infection spreads to roots and causes decay
- Terminal leaves turn yellow, wither and droop
- Fruits shrivel and drop off
- Entire plant topples over and dies



Survival and spread

- **Primary:** Oospores and saprophytic mycelium in soil and infected seedlings transplanted in the main field
- **Secondary:** Zoospores through irrigation water

Favourable conditions

- Appears from June to August
- Younger seedlings are more susceptible than older ones
- Severity increases with intensity of rainfall $\frac{3}{4}$ ill drained conditions and high soil moisture

Management

- Seedlings should be raised in well drained nursery area or in protrays in modern nurseries in protected polyhouses
- Uproot the diseased seedlings and burn

- Drench the base of stem with COC@0.25% or metalaxyl + mancozeb @0.1% or Bordeaux mixture 1%

2. NAME OF DISEASE – LEAF CURL OF PAPAYA

Pathogen-Tobacco leaf curl virus or Nicotiana virus 10

- Virus is a Geminivirus with geminate spherical particles having ssDNA as genome

Symptoms

- Severe curling, crinkling and distortion of leaves accompanied by vein clearing and reduction of leaf lamina
- Leaf margins are rolled downward and inward in the form of inverted cup
- Curled leaves have thickened veins $\frac{3}{4}$ Leaves become leathery, brittle and petioles are twisted
- Diseased plants fail to flower or bear any fruits
- In advanced stage, defoliation takes place and growth is arrested

Infected leaf



Survival and spread

- **Primary:** Virus particles on affected plants
- **Secondary:** Whitefly *Bemisia tabaci*
- Virus also infects tobacco, tomato, sunhemp, chilli, Petunia, Zinnia, Datura stramonium, hollyhock, cape gooseberry etc.

Management

- Disease free seedlings
- Rouging and destruction of diseased plants and other host species
- Erecting yellow sticky traps for whitefly trapping
- Vector control with monocrotophos at 1.6 ml/l or Dimethoate or metasystox at 2 ml/l

3. NAME OF DISEASE – MOSAIC DISEASE OF PAPAYA

Pathogen-Papaya mosaic virus or Papaya ringspot virus or Carica virus 1

- Virus is a potyvirus with long flexuous rod shaped particles having ssRNA as genome
- In India 1st reported from Mumbai and Pune and occurs more in central India
- 90-100% damage occurs in severe cases

Symptoms

- Mottling and puckering of leaves, especially the young ones
- Water soaked chlorotic spots on tender stem and petioles
- The lamina is reduced and malformed and are often modified into tendril like structures giving a shoestring appearance
- Decline and marked reduction in growth of diseased plants
- Older leaves fall down and a small tuft of younger leaves is left at the top in upright position
- Fruits develop innumerable circular, water soaked spots with concentric rings
- Fruit size is severely reduced with deformed shape



Survival and spread

Primary: Virus particles on affected plants

Secondary: Aphids mainly *Myzus persicae* and other species *Aphis malvae*, *A. gossypii*, *A. medicaginis*, *Rhopalosiphum maidis*, *Microsiphum solonifolii*

Other hosts: Cucumis sativus, Cucurbita pepo, C. maxima, Citrullus vilgaris, Luffa acutangula, Lagenaria siceraria, Safflower and some ornamental plants

Management

- Disease free seedlings raised in modern insect free net houses or poly houses
- Rouging and destruction of diseased plants
- Raising barrier crops like Sorghum on the boundaries of the field
- Vector control with systemic insecticides like dimethoate or methyl S demeton
- Carica cauliflora is resistant
- Growing transgenic (coat protein mediated) papaya varieties like Sun Up and Rainbow