DISEASES OF CITRUS CROP

Session-10
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CITRUS GUMMOSIS

CAUSAL ORGANISM:
Phytophthora nicotianae var. parasitica, P. palmivora, P. citrophthora

Economic importance:
- Gummosis is widespread in Punjab and Assam.
- Lemons are highly susceptible compared to grapefruit, rough lemons and sweet orange.
- In South India, it is common in the sweet orange.
- The disease cause citrus production losses in irrigated, arid areas as well as in areas with high rainfall.

Symptoms
- Disease starts as water soaked large patches on the basal portions of the stem near the ground level.
- First symptoms are dark staining of bark which progresses into the wood.
- Bark in such parts dries, shrinks and cracks and shreds in lengthwise vertical strips.
- Bark at the base is destroyed and finally death of the tree.
- Profuse exudation of gum from the bark of the trunk occurs. Prior to death, the plant usually blossoms heavily and dies before the fruits mature.
Favourable conditions

Prolonged contact of trunk with water as in flood irrigation; water logged areas and heavy soils favourable for the disease development.

Pathogen: *Phytophthora nicotianae* var. *parasitica*, *P. palmivora*, *P. citrophthora*

- Aseptate, intercellular and intracellular hypha.
- Sporangia are ovoid or ellipsoid.
- Sporangium attached with the sporangiophore at the right angles.
- Sporangia germinate to release zoospores.

Mode of spread and survival

- The fungus survives as oospores or as dormant mycelium. Sporangia and zoospores
- spread by splashing rain water and irrigation water.
Management

Preventive measures:

• Selection of proper site with adequate drainage and high budding (30 to 46 cm or above).
• Provision of an inner ring about 45 cm around the tree trunk to prevent moist soil. (Double ring method of irrigation)
• Avoid irrigation water from coming in direct contact with the trunk.
• Avoid injuries to roots or base of stem during cultural operations.
• Use resistant sour orange rootstocks for propagating economic varieties
• Tree trunk to a height of about 60 cm above the ground level coated with Bordeaux paste or with ZnSO4, CuSO4, lime (5:1:4) l at least once a year.

Curative measures:

• Scrape the diseased portion with a sharp knife.
• Protect the cut surface with Bordeaux paste followed by spraying of 0.3% fosetyl-AL reduces the spread.
• Soil drenching with 0.2% metalaxyl and 0.5% Trichoderma viride commercial formulation
CITRUS GUMMOSIS
CITRUS DIPLODIA GUMMOSIS

- **Causal organism:** Diplodia natalensis
  
  *(Perfect stage: Physalospora rhodina)*

- **Economic Importance:**
  
  - Occurs commonly in Andhra Pradesh, Tamil Nadu and Uttar Pradesh.
  - It is common on Sathgudi and Batavian oranges, mandarins and lemons in A.P. and Tamil Nadu.
Cont...

Symptoms:
- Profuse gumming on the upper portions of the trunk, branches and twigs.
- Infection starts at growth cracks or ridges at crotches.
- Gum oozes out from the cracks developed on the diseased portion.
- From bark, the infection spreads to wood which dries and becomes discoloured.
- Large limbs are killed and if left unchecked the whole tree may be killed in course of time.
- Sometimes branches break at the infected portion.

Favourable conditions
- Insect damage, malnutrition and old age predispose the disease.
Mode of spread and survival

Black pycnidial bodies appear on the diseased bark which gets removed in flakes.

- The disease spreads through dissemination pycnidiospores or conidia by air, rain and insects

Management

- The tress should be kept in a vigorous growing condition.
- Wound in the bark especially on limbs and forks should be scraped and protected with Bordeaux paste.
- Gummed portions of affected bark should be removed and the cut surface protected.
- Spraying with 0.1% carbendazim on the affected limbs and forks is useful to restrict the disease spread.
GUMMOSIS

DIPLODIA AFFECT THE TRUNK

Citrus Diplodia Gummosis
CITRUS CANKER

CAUSAL ORGANISIM:

*Xanthomonas axonopodis pv.Citri*

Economic Importance

- In India, citrus canker is endemic and occurs in all the citrus growing areas.
- It is reported from Punjab, Tamil Nadu, Andhra Pradesh, Karnataka, Rajasthan, Madhya Pradesh, Assam, and Uttar Pradesh.
- Acid lime is highly susceptible to canker.
SYMPTOMS

Canker appears on leaves, twigs, petioles, branches, fruit stalks, fruits and thorns.

- The lesions appear as minute water soaked round, yellow spots which enlarge slightly and turn brown, eruptive and corky.

- The spots are about 2 to 3 mm in diameter. These pustules are surrounded by a characteristic yellow halo in leaves.

- Canker lesions on the fruit do not possess the yellow halo as on leaves. Several lesions on fruit may coalesce to form a patch.

- The market value of the fruits is considerably reduced by the canker spots, though such infections are mostly confined to the fruit skin.

- Due to severe infections of the leaves there may be defoliation.

- Severe infections of the twig and stem may cause die-back symptoms.

- The plants also remain stunted and fruit yields are reduced considerably.
CITRUS CANKER IN LEAF AND FRUIT
CITRUS CANKER ON STEM

Zig-zag structure on lower surface of leaf due to leaf miner
Favourable conditions:
- Free moisture for 20 minutes at 20-30°C initiates the disease.

Mode of survival and spread:
- Bacteria overwinters in leaf, twig and fruit canker lesions.
- Citrus leaf miners (*Phyllocnistis citrella*) helps in the dissemination of the pathogen.
- It is spread by rain splashes.
MANAGEMENT

• Prune out and burn all canker infected twigs before monsoon.
• Periodical spraying of bactericides along with an insecticide.
• Select seedlings free from canker for planting in main field.
• Spray Streptocycline (1g) + Copper oxy chloride (30g) in 10 liter of water at 15 days interval effective management for citrus canker.
• Control leaf miner when young flush is produced.
• Neem cake @ 160 Q/ha. to control disease & leaf minor.
• Growing of disease free resistant varieties like, Kagji Nimbu–SN-2, Sankar–3, Sankar-4 etc.