



DISEASES OF CITRUS CROP

Session-10

M.S.Swaminathan School of Agriculture,CUTM



CITRUS GUMMOSIS

CAUSAL ORGANISM:

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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.



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Favourable conditions

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• 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.

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Management

Preventive measures:

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- 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.

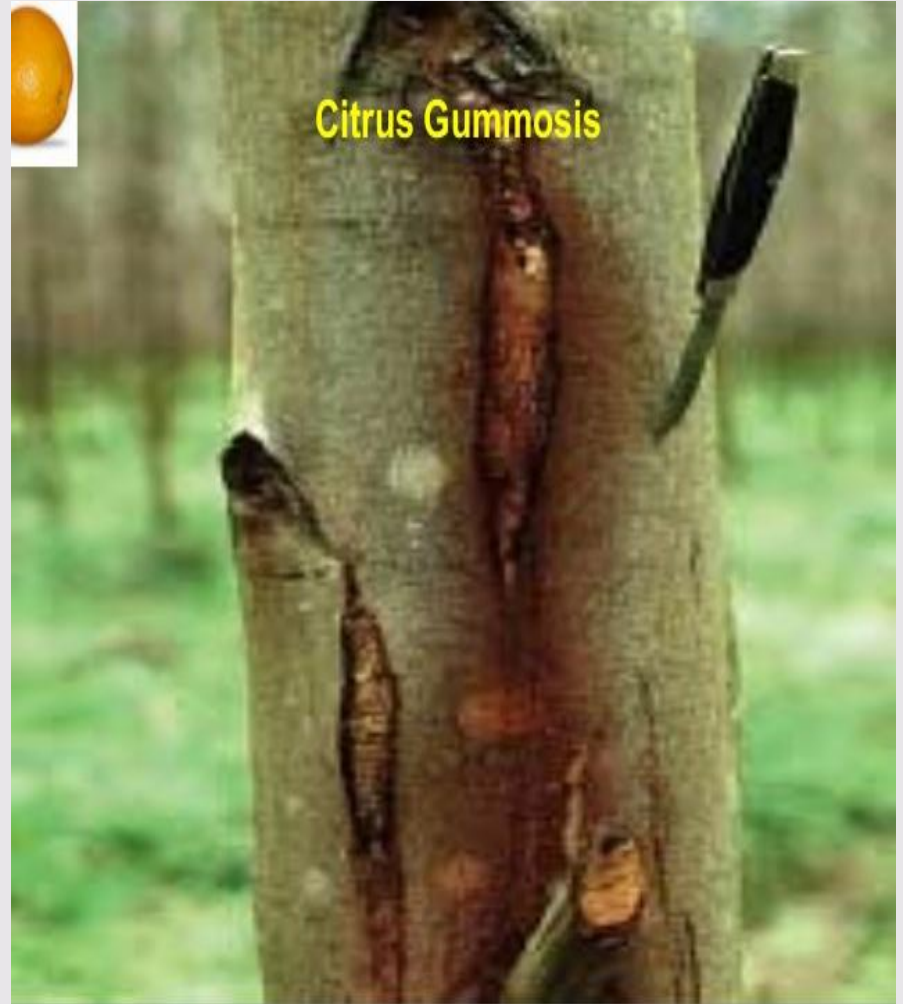
Curative measures:

- 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



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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.



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Symptoms:

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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.



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Mode of spread and survival

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- 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.



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DIPLODIA AFFECT THE TRUNK



Citrus *Diplodia* Gummosis





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CITRUS CANKER

• CAUSAL ORGANISM:

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.



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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.



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CITRUS CANKER IN LEAF AND FRUIT





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CITRUS CANCKER ON STEM



Zig-zag structure on lower surface of leaf due to leaf miner





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Favourable conditions:

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- 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.



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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.*