## Phytophthora Disease Management in Citrus

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#### Citrus Diseases

- Phytophthora Root Rot
- Phytophthora Gummosis
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#### New or ongoing concerns

- Hendersonula Dieback
- Coniophora wood decay

## Phytophthora Root Rot

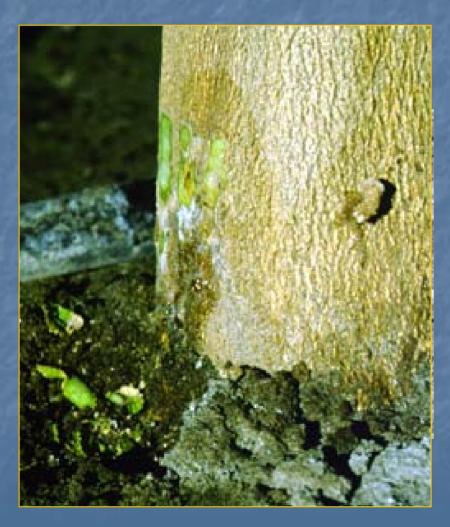




# Susceptible Rootstock *Phytophthora* spp.



# Phytophthora Gummosis









#### Causal Organisms

- Phytophthora parasitica
  - Warm season pathogen: active May November
  - Causes gummosis and root rot
- Phytophthora citrophthora
  - Cool season pathogen: active November –
     March
  - Causes gummosis, root rot and fruit rot

### Root rot symptoms

- The disease destroys the feeder roots of susceptible rootstocks.
- The fungus infects the root cortex, which turns soft and separates from the stele.
- Water uptake of water and nutrients will be (severely) limited.
- Tree will grow poorly, stored energy reserves will be depleted, and production will decline.

## General Symptoms

- Slow decline
- Foliage light green
- Leaves cup toward each other as in water stress
- Little leaf syndrome with severe zinc deficiency
- Canopy thinning leaf loss
- Sap oozing from the lower trunk (gummosis)
- Dieback
- Death

### Management

- Rootstock selection
- Irrigation practices
- Fungicides

#### Rootstock selection

Rootstock	Gummosis	Root rot	Nematode
Lemon			
Macrophylla	Tolerant	Tolerant	Susceptible
Volkameriana	Susceptible	Susceptible	? Susceptible
Others			
C-35	Tolerant	Tolerant	Tolerant
Carrizo	Intermediate	Tolerant	Tolerant
Sour orange	Tolerant	Intermediate	Susceptible
Trifoliate orange	Tolerant	Tolerant	Tolerant

#### What lemon rootstock should I use?

- If there is a history of root rot Macrophylla
- If soils are heavy Macrophylla

#### Irrigation Management

#### Gummosis

Irrigate away from the tree trunk so that the tree scion stays dry

#### Root Rot

- Apply water evenly:
  - Excessive water helps the fungus
  - Excessive dry causes roots to crack

# Other management strategies for replant situations

- Sample for *Phytophthora* and Citrus nematode (*Tylenchulus*)
- History of root rot fumigate
- Uncertain if there was a history of root rot
  - preventive fungicides
    - Aliette
    - Ridomil

## Management of Gummosis

- Change emitters if they are causing the water to come in contact with the trunk
- Treat lesions with a fungicide when gumming is active, 2 times/year for 1 to 2 years
- If the lesion covers more than 50% of the tree, consider replacing the tree

#### Summary

- Phytophthora spp. are common in California and it is the number one disease of citrus
- These diseases is controllable especially with appropriate rootstock selection and water management practices

#### Useful Web Sites

- UC Pest Management Guidelines <a href="http://www.ipm.ucdavis.edu">http://www.ipm.ucdavis.edu</a>
- Newsletters and publications: <a href="http://ceriverside.ucdavis.edu/">http://ceriverside.ucdavis.edu/</a>
- UC Entomology Biocontrol: http://www.biocontrol.ucr.edu
- UC Fruit & Nut Center: <a href="http://fruitsandnuts.ucdavis.edu">http://fruitsandnuts.ucdavis.edu</a>