

### PHYTOPHTHORA ROOT ROT



Healthy roots



Damaged roots



Root damage impairs the water and nutrient uptake



Root damage can deplete stored carbohydrate

**SCIENTIFIC NAME:** *Phytophthora nicotianae* or *P. palmivora* in wet soil

**SYMPTOMS:** Soft, water soaked root cortex; cortex sloughs off (comes off to touch) to leave thread-like tips; little to no water or nutrient uptake leading to wilting; mature trees difficult to diagnose; reduced fruit size and/or number; leaf loss; twig dieback; reduced yield over several years.

**MANAGEMENT:** Resistant rootstocks like Swingle\* or trifoliate oranges; plant clean nursery stock; plant bud union at least 6 inches above soil line; good grove drainage; Diaprepes and fire ant control; fungicides.

\*If *P. palmivora* and Diaprepes are present, Swingle is not resistant. Consult Diaprepes website: <http://www.crec.ifas.ufl.edu/extension/diaprepes/>

### DIAPREPES ROOT WEEVIL



Adult weevil is about 3/8 to 3/4 inch



Adult weevil feeds on young leaves causing a notching on the leaf margin



Root girdling by the *P. nicotianae*-*Diaprepes* complex on sour orange (Desoto County)



Leaf notching caused by Diaprepes root weevil

**SCIENTIFIC NAME:** *Diaprepes abbreviatus*

**SYMPTOMS:** Adults cause leaf notching, but larvae feed on roots; feeding allows the *Phytophthora* spp. to cause greater root damage; can destroy tap root.

**MANAGEMENT:** Good grove drainage; weevil-free *Phytophthora* resistant rootstock; foliar sprays for adult and egg suppression; chemical barrier for larval control; biocontrol of subterranean stages with insect-killing nematodes; best Diaprepes management practices are site specific –key to determine best strategies for site can be found at: <http://www.crec.ifas.ufl.edu/extension/diaprepes/>

Follow pesticide recommendations in the annual Florida Citrus Production Guide:  
<https://crec.ifas.ufl.edu/resources/production-guide/>

## PHYTOPHTHORA FOOT ROT



Yellow veins



Shoot dieback



Damage to trunk



Damage to trunk

**SCIENTIFIC NAME:** *Phytophthora nicotianae* or infrequently *P. palmivora*

**INITIAL SYMPTOMS:** Yellow foliage fall/winter and poor growth to shoot dieback.

**TERMINAL SYMPTOMS:** Leaf drop; fruit drop; further dieback leading to tree death.

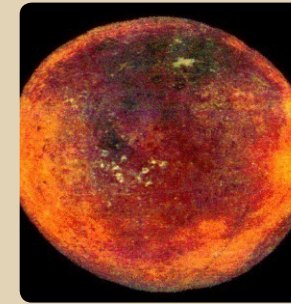
**TRUNK SYMPTOMS:** Bark cracking; gumming; lesions can girdle trunk; found near the crown to below soil line; some healing can occur.

**MANAGEMENT:** Prevent prolonged wetting of trunk; control fire ants; choose resistant rootstocks; fungicides (timing and products can be found in the Citrus Production Guide). Consult Diaprepes website: <http://www.crec.ifas.ufl.edu/extension/diaprepes/>

## BROWN ROT



Brown rotted fruit on grove floor



Brown rot on Hamlin orange



Brown rot on grapefruit



Fruit drop caused by brown rot



Fruit drop caused by brown rot

**SCIENTIFIC NAME:** *Phytophthora palmivora* or *P. nicotianae* (if caused by *P. nicotianae*, confined to bottom third of canopy)

**SYMPTOMS:** Light brown leathery decay; white fungal growth on surface when humid; infected fruit have strong, sharp smell; can spread in packing container after fruit is harvested.

**MANAGEMENT:** Skirt trees; herbicide strip just inside drip line; apply fungicides in late July; see the Citrus Production Guide.

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<https://crec.ifas.ufl.edu/resources/production-guide/>