

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 above soil; 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/key.htm>

Follow pesticide recommendations in the annual Florida Citrus Pest Management Guide:
<http://www.crec.ifas.ufl.edu/extension/pest/index.htm>

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PHYTOPHTHORA FOOT ROT



Yellow veins



Shoot dieback



Damage to trunk



Damage to trunk

SCIENTIFIC NAME: *Phytophthora nicotianae*

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

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

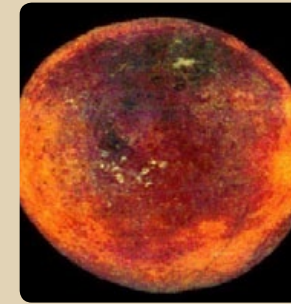
TRUNK SYMPTOMS: Bark cracking; gumming; lesions can girdle trunk; found near the crown to below soil line; some healing can occur.

MANAGEMENT: Prevent prolonged wetting of trunk; control fire ants; choose resistant rootstocks, fungicides (timing and products can be found in pest management guide).

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; fungicide applications in late July.

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