IPC GENERAL INFORMATION

1 PURPOSE

- Psyllid exclusion is the most effective strategy to keep citrus trees free from HLB
- IPCs are a novel strategy based on psyllid exclusion of individual trees using a protective mesh bag
- This strategy is currently being adopted by many growers
- IPCs can be installed on solid blocks of trees or in resets
- IPCs are especially valuable for planting reset trees in gaps left by dead or removed trees in mature groves where HLB incidence is typically higher, and the risk of infection is therefore greatest
- IPCs should be placed immediately during planting to prevent any exposure of trees to the psyllids.

2 IPC INSTALLATION

Place pole next to tree

Fully cover tree with IPC mesh

Tie closed IPC mesh at base of tree

3 RESEARCH FINDINGS

- IPCs effectively exclude psyllids.
- IPCs maintain trees free from HLB.
- IPCs also reduce canker incidence.
- IPCs do not exclude all pests, and armyworms, black scales and mites are often present. This means that regular scouting and insecticide application may still be necessary.
- Fruits produced under IPCs have better internal quality and significantly more soluble solids (Brix) than fruit from HLB-affected trees.

Funding

CRDF Citrus Research and Development Foundation, Inc.

For more information, please contact Fernando Alferez, alferez@ufl.edu

IPC PEST MANAGEMENT

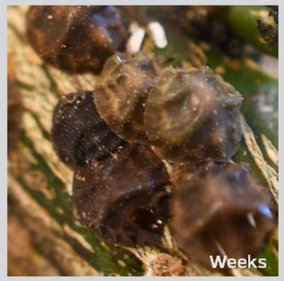
1 INSECTS AND MITES COMMONLY FOUND IN IPCs

Mites

Citrus red mite

Two spotted spider mite

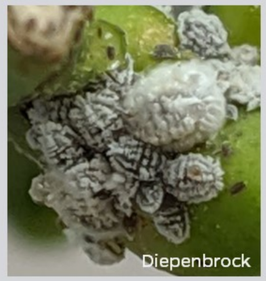
Scales



Black scale

Soft green scale

Mealybugs



Lebbeck mealybugs

Long-tailed mealybugs

Caterpillars

Southern armyworm

Leafroller

2

PEST ENTRY INTO IPCs

- IPCs are not a closed system
- Very small pests can enter through the IPC mesh on wind
- Caterpillars likely enter IPCs as hatchlings from eggs laid on the IPC
- Ants have been seen moving small pests like mealybugs between IPCs, establishing new infestations
- Some pests can crawl up trunk and establish in canopy

Graphic by: T.R. Weeks

Funding: USDA HLB Multi Agency Coordination Group

3

IPC MANAGEMENT

- Scouting is ideal but not time efficient
- IPCs as a sole means of pest management is not sufficient to protect trees from pests other than ACP
- Reactive management may not prevent irreversible damage to trees
- Prophylactic soil drenches should prevent most pests from building up damaging populations
- Topical insecticide applications may be necessary to control pests that establish in bags
- Airblast sprayers may not provide sufficient penetration into bags, speed and spray particle size will need to be adjusted
- Handgun sprays can penetrate bags but are time consuming
- Opening bags to spray allows good coverage but is labor intensive

For more information, please contact Lauren Diepenbrock, ldiepenbrock@ufl.edu

IPC DISEASE MANAGEMENT

1 DISEASES COMMONLY FOUND IN IPCs

GREASY SPOT

Fungus *Zasmidium citri-griseum*

CITRUS CANKER

Bacterium *Xanthomonas citri* subsp. *citri*

SOOTY MOLD

Fungus *Capnodium citri*

2 DISEASE ENTRY INTO IPCs

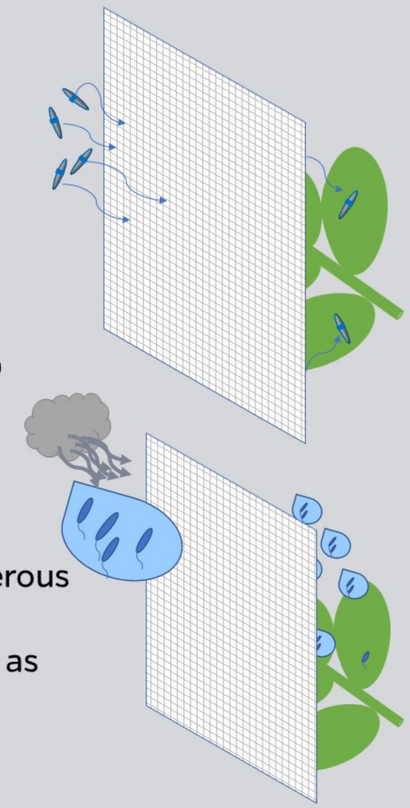
- Disease causing agents are generally microscopic
- Can pass through mesh easily

Greasy spot

- Wind speed is slowed by mesh, reducing number of spores able to pass through (top graphic)
- Infection conditions still favorable in bags

Citrus Canker

- When rain drops hit the mesh, the drops become smaller and slower but more numerous (bottom graphic)
- Slower speed droplets are not able to force as many bacteria into leaves
- Some bacteria able to move into leaves by themselves



3 IPC MANAGEMENT

- Scouting is best, but if surrounded by older infected trees, canker and greasy spot are likely in IPCs
- Both can still cause defoliation, slowing tree growth
- Greasy spot inoculum may accumulate within the bags
- Copper application in early June and mid-July will help keep the leaves clean from greasy spot
- On young trees, a drench program of Blockade® is effective to reduce canker on leaves within IPCs in combination with copper applications
- As canopy becomes denser, will need to ensure adequate coverage for disease suppression
- More canker will occur on foliage as it starts to touch the mesh and require more management

Funding: USDA HLB Multi Agency Coordination Group

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