Pest management in IPCs and new pest management challenges

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Benefits of IPCs

- Reduces access to young trees by ACP
- Rapid tree growth
- Potential to save on insecticide applications
- Synchronized flushing

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Challenges of IPCs

- Many parameters unknown
  - How to scout?
  - What pests are a problem and when?
  - How do we treat trees in bags?
  - How long to leave a bag on?
  - Impacts on roots?
  - Water/nutrition needs?

Image courtesy of Tracy Hobbs, Dewdney lab

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Scouting

- How often?
  - Unknown optimal frequency for bugs or pathogens
  - Ongoing research is using monthly
- HOW?
  - Bags on/off?
  - Can't see through bags, so how do you know if there is a problem?

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What pests get into bags? When?

- Area of active research*

Spider Mites
MAC planting
CREC
(May 2020)

Phytophagous Snail
Bulimulus sporadicus
Grower field
(July 2020)

Lebbeck Mealybug
Multiple grower fields
(year-round)

Greasy Spot
Grower field
(July 2019)

*HLB MAC grant awarded to Diepenbrock, Dewdney, Johnson, Vincent, and Kadyampakeni

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How do we treat pests in bags?

- Area of active research
- Options
  - Soil drenches- insecticides
  - Foliar applications- insecticides, fungicides
  - Use of biological controls in bags

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How long should bags stay on?

- Canopy development is greater in bagged trees than trees not bagged
  - What size of bags is optimal?
  - Should smaller bags be replaced with larger bags as trees become too large for initial bags?

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More unknowns

- What is the influence of IPCs on root development?
- Do IPCs impact nutrient and/or irrigation needs of trees?

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New pest management challenges

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Bulimulus sporadicus

- Introduced species from West Indies
- Species first found in FL in 2009, found in several locations in FL now
- Appears to eat decaying vegetation (e.g. weeds)
- Active under high humidity

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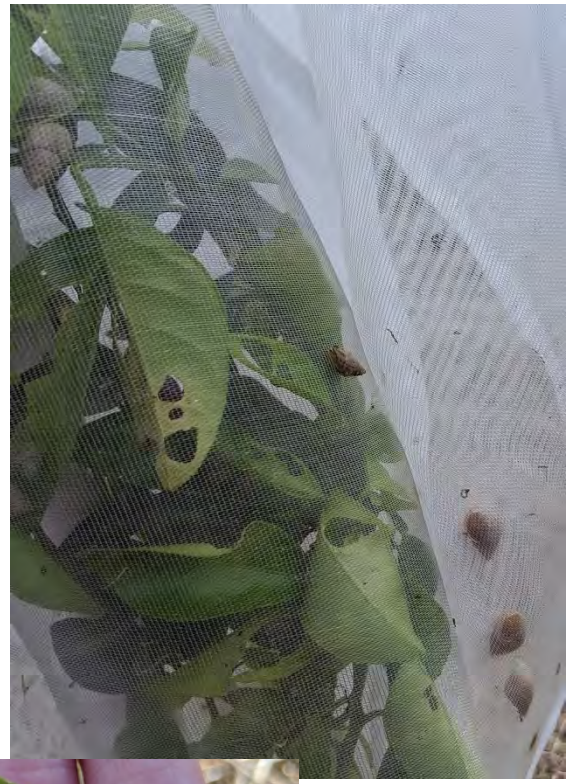
Bulimulus sporadicus in citrus

- Mostly on ground cover
- Major problem: clogging irrigation
- Secondary concern: damaging plants when trapped in bags



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What can we do about snail problems?

- Remove host vegetation (weeds)
- Treat with a molluscicide
  - Attractive baits containing metaldehyde are often effective for snails and slugs
  - Baits soon to be evaluated
- Clearing irrigation?
  - Need something that can dissolve their shells, which are calcium based

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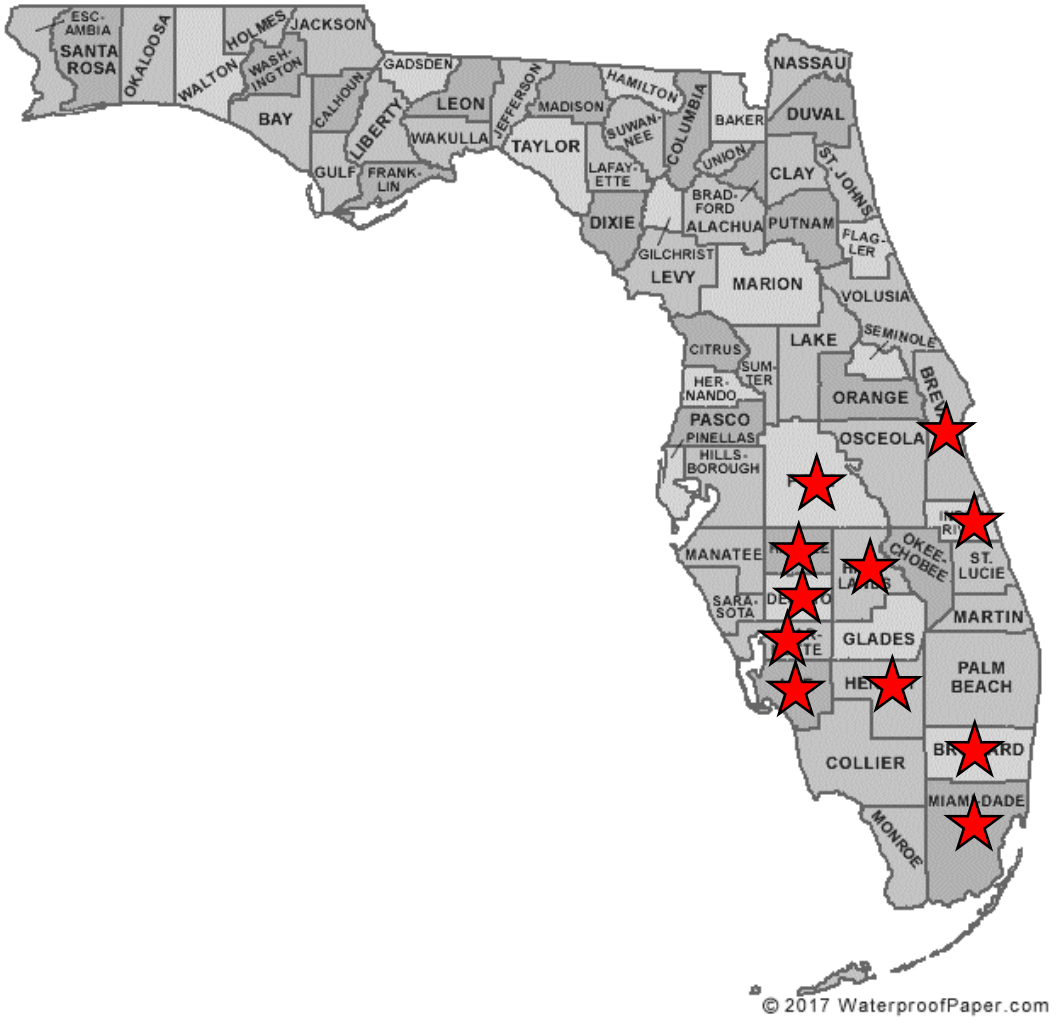
Lebbeck Mealybug (*Nipaecoccus viridis*)

- Current known distribution in Florida:
  - Commercial (10 counties)
    - Brevard, Charlotte, DeSoto, Hardee, Hendr Highlands, Indian River, Lee, Miami-Dade, Polk
  - Residential (1 county)
    - Broward
- 22 non-citrus hosts so far in Florida



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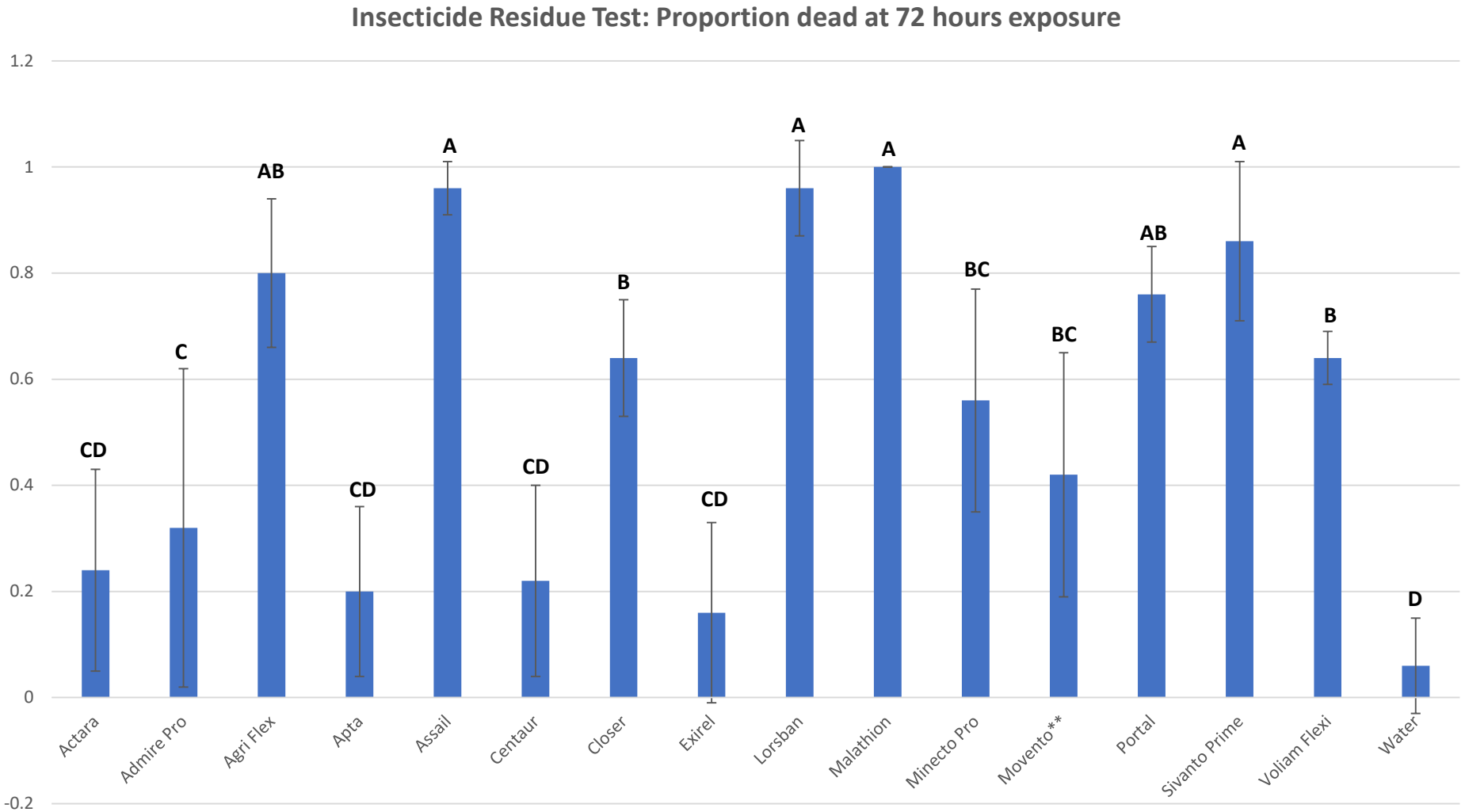
Insecticide residue screening (lab data)



All materials tested at maximum labelled field rate

Not ALL are compatible with beneficial insects

All can be enhanced with oil.

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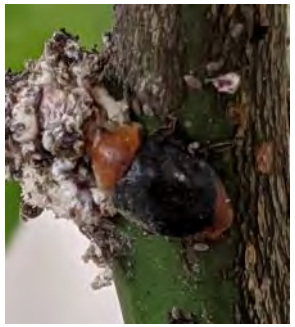
The “good guys”



- Predatory bugs = best long-term management options
- Need to help them along at times with selected pesticides
- May need to provide alternate resources for predators and/or supplement the system

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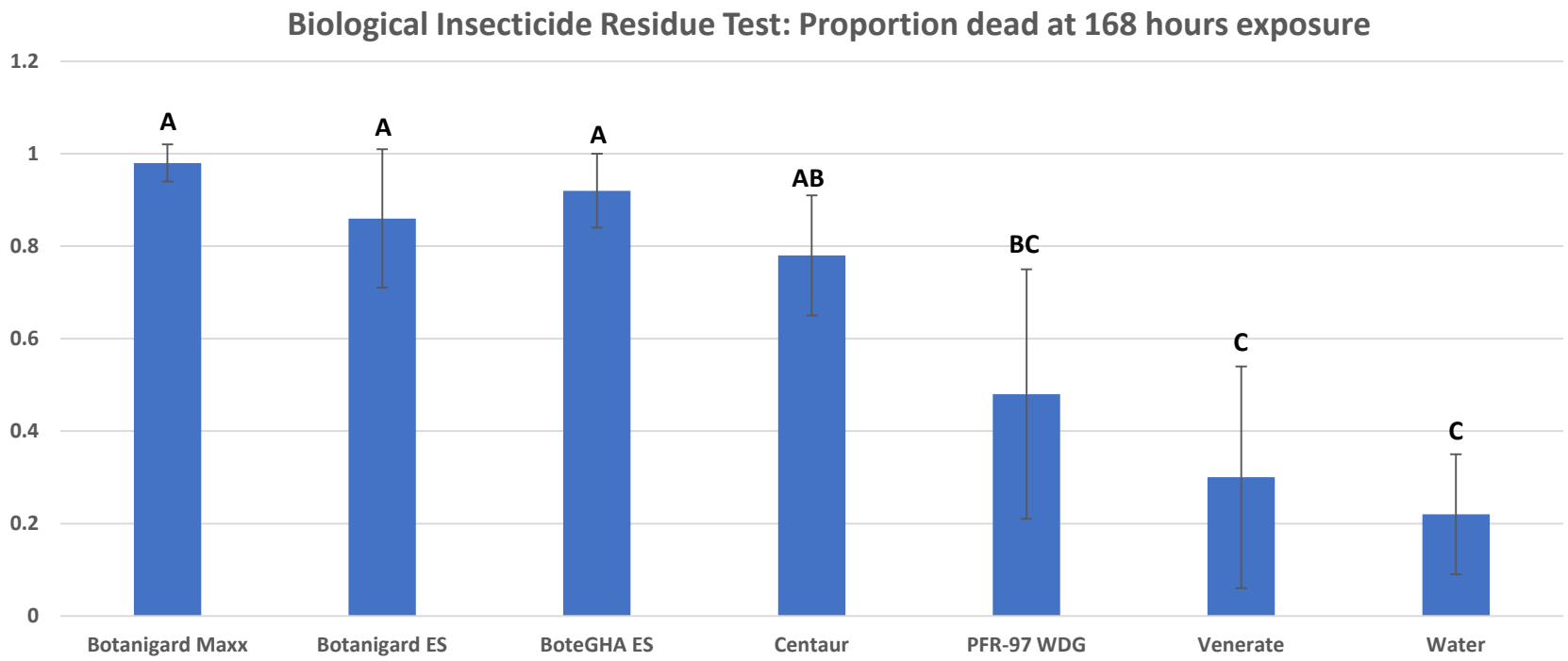
Biological insecticide options



Increases management options:

Entomopathenogenic fungi (EPF) or IGR could be used in rotation with other chemistries, would be ideal for use following a knockdown material.

EPF may be an option for use in bags as a pretreatment

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EPFs in IPCs?

- Spores may last longer in IPCs than open fields, potentially providing weeks of control for certain pests
- Unbag - spray - re-bag
  - Consider worker safety in product choice

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Pest management is a moving target

- As we continue to grow in an era of endemic HLB, pest management will continue to evolve.
- There will be trade-offs regarding management tactics depending on individual grove/grower needs
- New tools/tactics enhance opportunities to rethink IPM in citrus
  - IPCs, BT, new varieties, windbreak enhancements, new MOAs, etc.

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