

Cooperative Program to Manage *X. glabratus* in avocado

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- L. Lodyga, (FDOACS, Miami, FL)
- M. Thomas (FDOACS, Gainesville, FL)
- R. Ploetz & J. Smith (UF Plant Pathology)
- P. Kendra & N. Epsky (USDA, Miami, FL)
- & Almost Everybody Else in this room....

Acknowledgments

- Florida Avocado Committee, Homestead, FL
- University of Florida, Gainesville, FL
- FDOACS, Fort Pierce, FL
- USDA APHIS PPQ

Chronology of Past Events

- 2006
- Cv. Donnie, placed in St. Georges Island, FL to determine if RAB and LW could be recovered from it.
- Both RAB and LW were recovered from 2 dying trees (Mayfield et al., 2008)



Chronology of Past Events

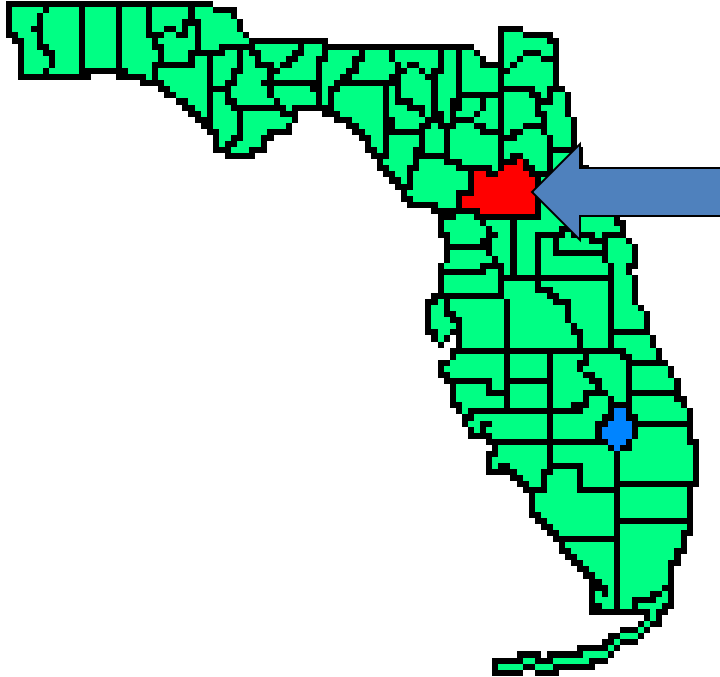
- **2007**: Fort Pierce: Quarantine Conditions
- *X. glabratus* bored into avocado cvs., Hass, Simmonds, Monroe, Winter Mexican, Catalina, but not into *Quercus virginiana*.
- (Mayfield et al., 2008)



2007

- World Congress of Avocado, Vina del Mar
- Chile
- Avocado Brainstorming, San Felipe, Chile
- Posters, slide presentation to inform researchers, growers, extension agents about this problem.

Chronology of Past Events: 2008



Additional avocado cultivars are tested for RAB and LW at CITRA, FL



Materials and Methods

4 trees of each cultivar transported from Homestead to Citra and placed in a greenhouse located at the Plant Science RE Unit, Citra, Florida.

2 trees of each cultivar were infested with 4 beetles and 2 were Not infested (untreated control)

Tree performance (i.e., wilting, dessication) was evaluated every week



All 13 Avocado Cultivars were Bored by RAB

- Bernecker Beta
- Brookslate Choquette Donnie* Dupuis Hall
- Loretta Lula Monroe
- Simmonds*
- Tower2 Waldin

Cultivars Showing Wilting: 1 month after



Simmonds



Tower

Cultivars Showing Wilting: 1 month after



Waldin



Bernecker

Negative and Positive LW Disease Results:

- Negative Results

»
»

- Brookslate
- Loretta
- Dupuis
- Tower2

Positive Results:

- | | | |
|-----------|-----------|------|
| Choquette | Donnie* | Hall |
| Lula | Monroe | |
| Simmonds* | Beta | |
| Waldin | Bernecker | |

October, 2008, Malabar FL



Productive avocado backyard
Tree with symptoms of RAB
and LW



Young avocado Tree: No
symptoms, no RAB

Current Events: 5 Months after

- Feb 2009: Malabar, Brevard Co., FL



Exit holes on formerly
Healthy tree



Leaves wilting

Young avocado Tree: within 5 months of first observation



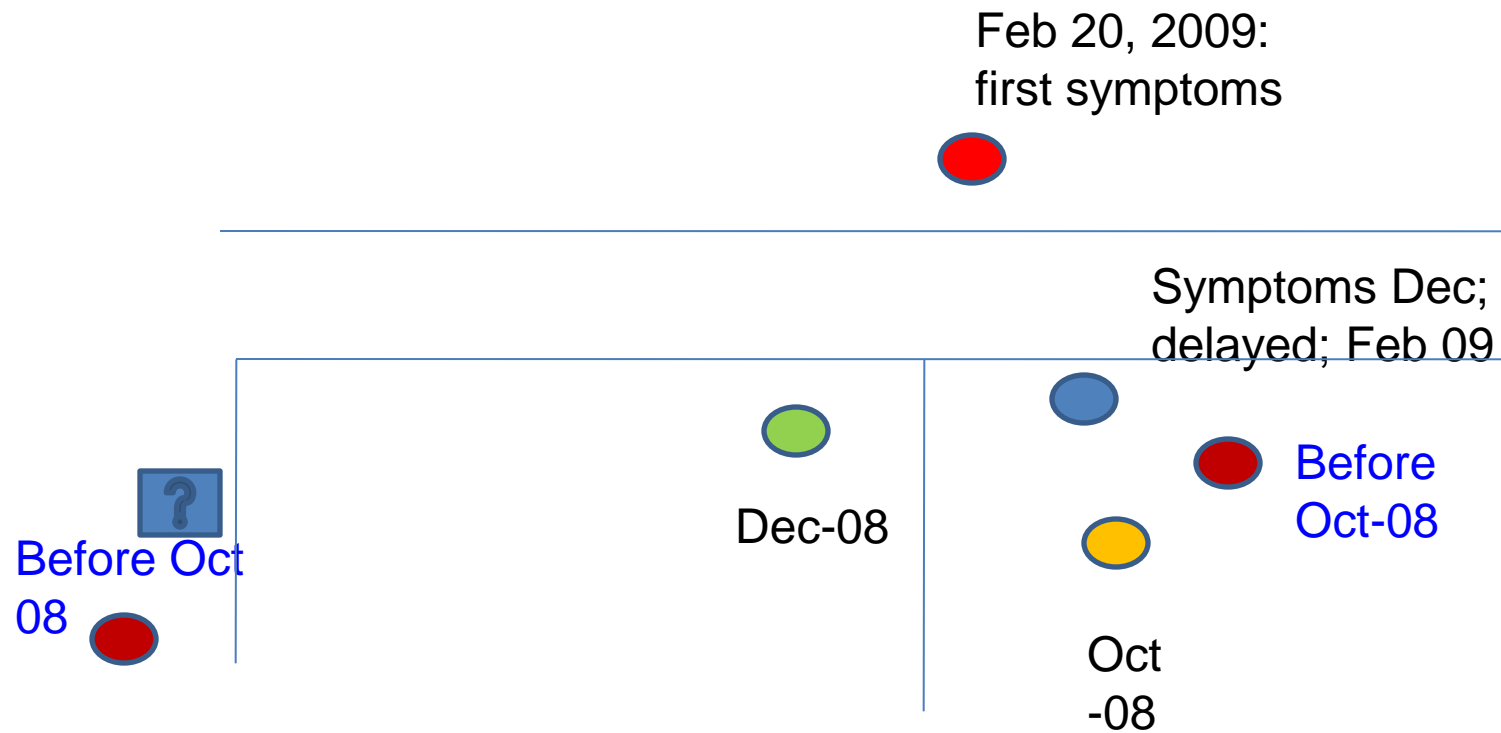
Malabar, FL Oct 2008



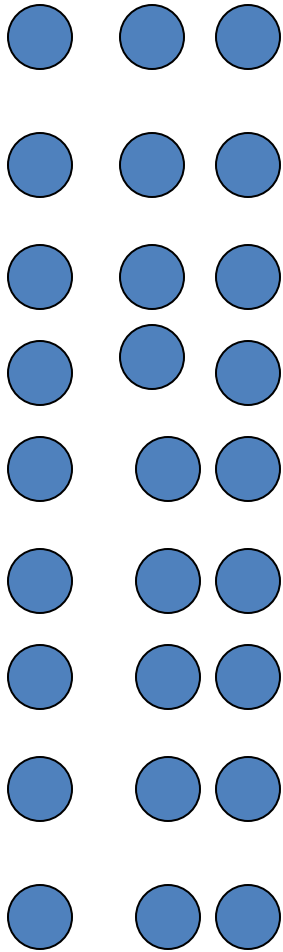
Malabar, FL, Feb 2009



Possible Chronology of the RAB and LW Infestation on Backyard Avocados : Malabar, FL: 5 Months



Would LW Progress in commercial Avocados in a similar way than in backyards?



Ambrosia and Bark Beetles in SFL:

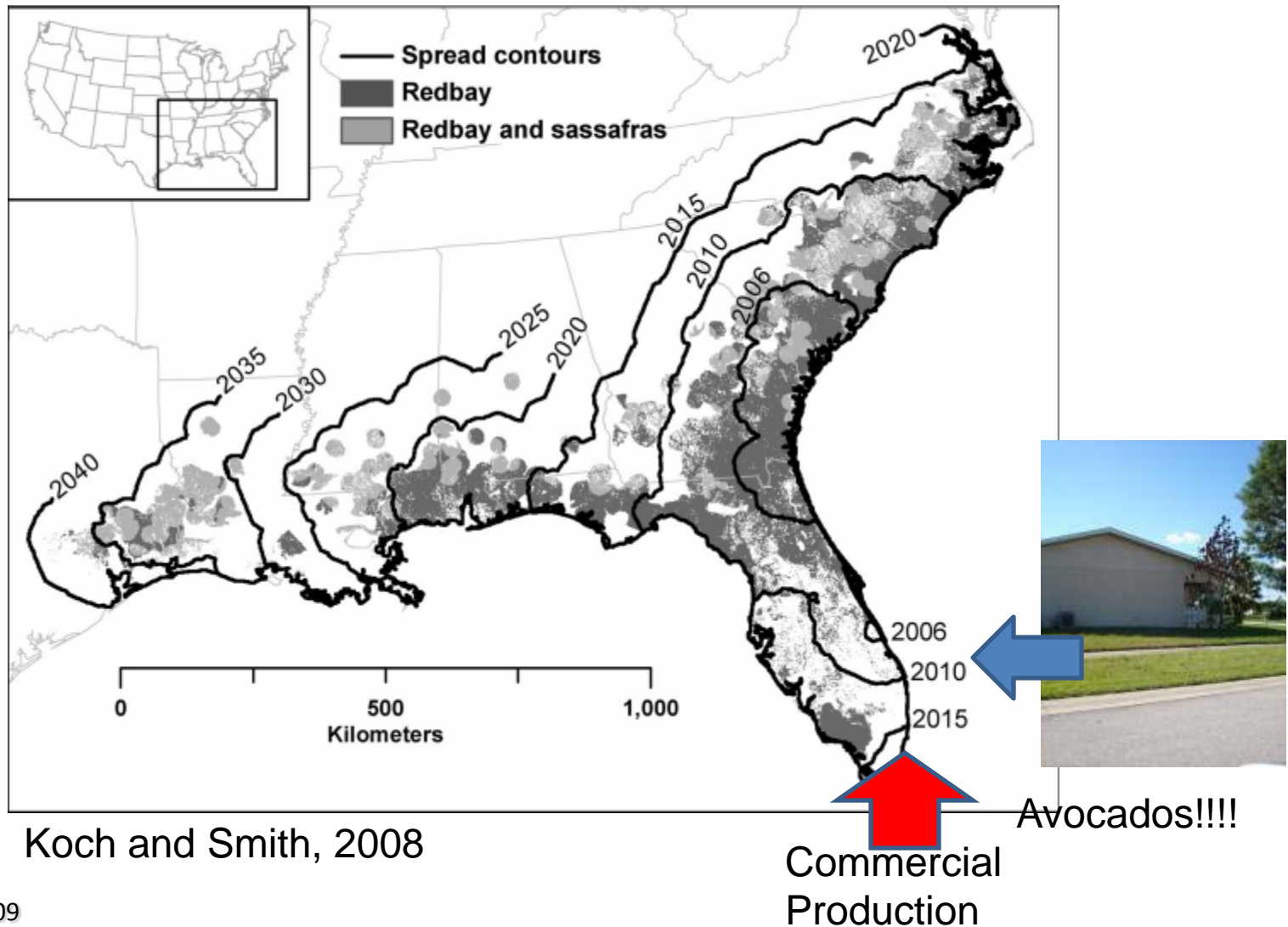


**Prefer stressed trees,
but they can also
attack healthy trees**

Beetles Collected from Stems of Tropical and other Fruit Crops 1983-2009: Homestead, FL (Peña et a., unpubl.)

| Crop | Family | Genera | species | |
|-------------|----------------|--------------------------|--|-------------|
| Annona spp. | Scolytidae | <i>Pityophilus</i> spp. | | |
| Mango | Scolytidae | <i>Xyleborus</i> | <i>vulvulus</i> | |
| | Colydiidae | <i>Colydium</i> | <i>lineola</i> | Role? |
| Longan | Scolytidae | <i>Hypothenemus</i> | sp. | |
| Peach | Scolytidae | <i>Hypothenemus</i> | sp. | |
| Tamarind | Scolytidae | <i>Hypothenemus</i> | sp. | |
| Avocado | Scolytidae | <i>Hypothenemus</i> | sp. | |
| | | <i>Theoborus</i> | <i>solitariceps</i> | |
| | | <i>Xylosandrus</i> X. | <i>crassiusculus</i> <i>compactus</i> | |
| | Monotomidae | <i>Europs</i> | sp. | Predaceous? |
| | Laemophloeidae | <i>Cryptolestes</i> | <i>klapperichi</i> | |

Arrival of RAB and LW Might be sooner than predicted in the avocado commercial production area



Priorities for the avocado industry:

Extension Education

Detection and survey

Insecticides to kill vectors

Fungicides vs. LW

Sanitation

First Priority: Inform those in counties located 100-150 miles N of the Avocado Producing Area : October 2008-'til today

Extension Agents
Alert

Inform Master
Gardeners

Rare Tropical Fruit
Chapters ; nursery
owners

Information at
Churches:
homeowners

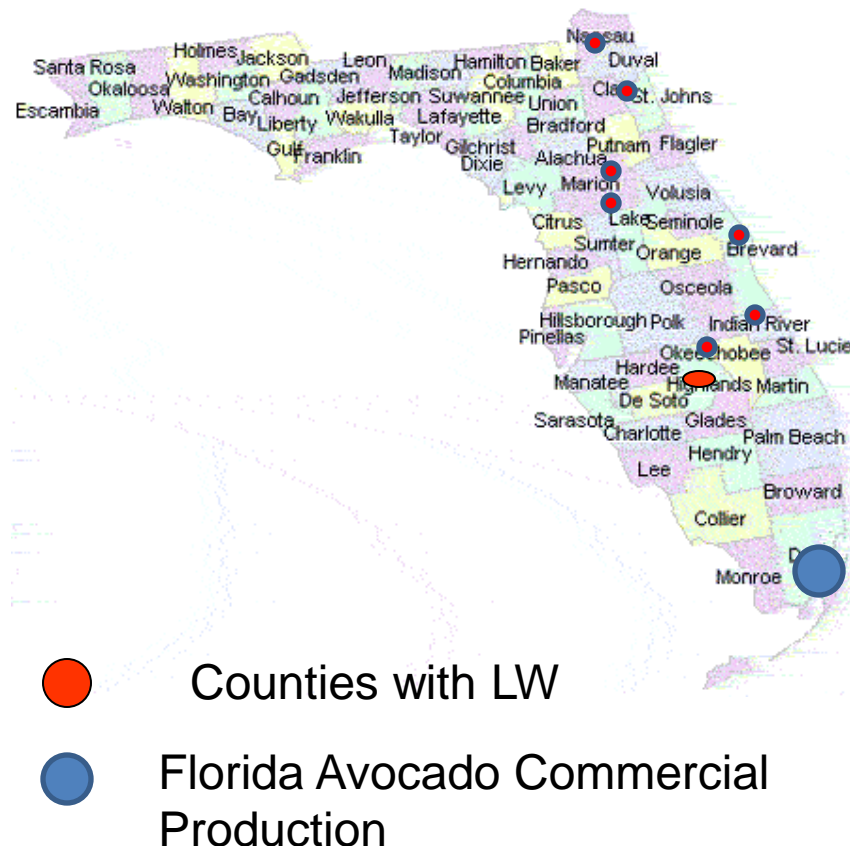
Conservancy
Groups, Natural
Parks with host
plants

UF Surveys Conducted in Natural Areas: Miami-Dade: 2008-present



Deering State Park
&
Everglades National Park

Improved detection and survey activities: UF, FDOACS, CAPS



- Intensify survey in St. Lucie, Martin, Palm Beach, Broward, Hendry, Glades, Collier,
- Lee, Miami-Dade:
- Red Bay natural stands,
- Parks
- Avocado: homeowners

Chemical Control: Short Term



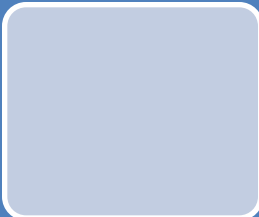
Chemical Control systemic fungicides

- Residue PHI
- R. Ploetz & J H Crane



Chemical Control Contact Insecticides

- Residue PHI
- JEP & JHC



Exemptions to make effective pesticides

Available to growers

- JHC & Agencies

Commercial Avocados: What to do if an LW is present in an avocado grove?

- Sanitation to reduce insect vectors:
- Chipping, burning...however, burying not an option in Miami-Dade
- Avoid stumps in a grove...
- Insecticides to kill vectors..
- Injecting Fungicides?



Research on Attractants and Detection Methods

Investigate the role that induced volatile cues from *Persea borbonia* and *P. americana* may play in host finding by *X. glabratus* adults.

Collect, identify , and compare the volatiles from *P. borbonia* & *P. americana*

Collect, identify, and compare the volatiles from *P. borbonia* and *P. americana* with recent feeding and infection symptoms from laurel wilt.

Quantify the behavioral responses of *X. glabratus* adults to induced volatiles from *P. borbonia* and *P. americana* in the laboratory; and

Quantify the antennal electrophysiological responses of *X. glabratus* adults to induced volatiles?

Repellents?

- Could volatiles from “non host trees” be used as repellents vs. RAB?
- Non host trees: Area of invasion?
- Non host trees: Areas of Origen ?

Many Unanswered Questions:

- 1. Life History of RAB in avocado?
- 2. Host Selection and Flight Response
- 3. Flight capacity?
- 4. Which other beetles besides RAB will carry
- LW?



Many Unanswered Questions

- Mass trapping around red bay stands?
- Chemical control on red bay?
- But most important:
- What is the area of origin of RAB?
- Work in those areas where RAB is reported in Asia needs to be done : Entomology & Plant Pathology