Proposed strategies for RAB and LW in the home landscape

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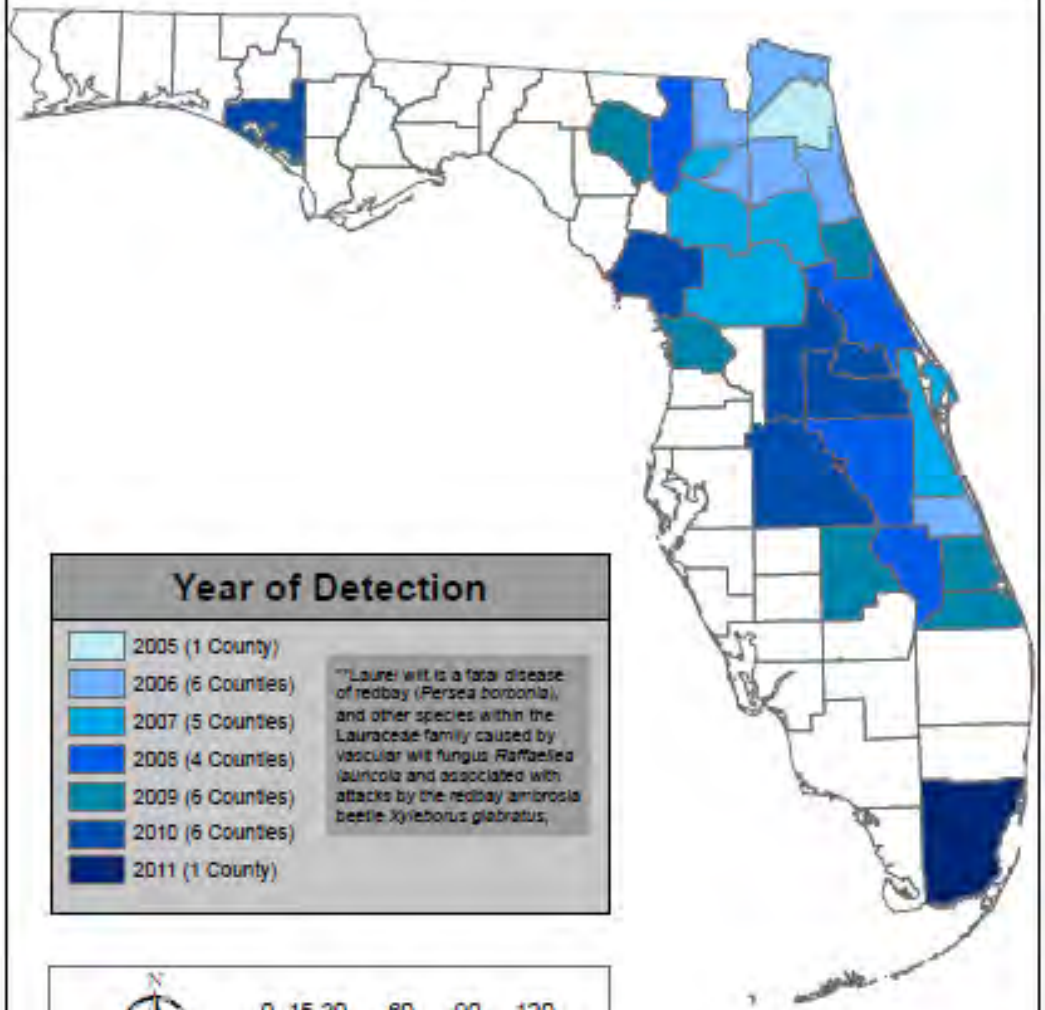
Update on Laurel Wilt
Location of the LW positive trees in Miami-Dade County

- Three swampbay (*Persea palustris*) trees were sampled February 1, 2011.
- Between mile marker ~20 and 21 on east side of Krome Avenue.
- Samples were sent to 3 laboratories
  - DPI, Gainesville
  - J. Smith, UF-SFRC
  - R. Ploetz, UF-TREC
- Visual – CSMA selective augur - symptoms
- Molecular testing
  - PCR amplification of diagnostic small subunit (rDNA)
  - PCR amplification of diagnostic microsatellite DNA loci
- Koch's postulates
  - Inoculate container-grown 'Simmonds' avocado trees with isolates from suspect trees

Distribution of Counties with Laurel Wilt Disease** by Year of Initial Detection



Year of Detection

- 2005 (1 County)
- 2006 (6 Counties)
- 2007 (5 Counties)
- 2008 (4 Counties)
- 2009 (6 Counties)
- 2010 (6 Counties)
- 2011 (1 County)

**"Laurel wilt is a fatal disease of redbay (*Persea borbonia*), and other species within the Lauraceae family caused by vascular wilt fungus *Raffaelea lauricola* and associated with attacks by the redbay ambrosia beetle *Xyleborus glabratus*.

N W E S

0 15 30 60 90 120 Miles

Date: 2/25/2011

FDACS, DPI, CAPS
J. Dietz, L. Whitby, W. Dixon
Map for illustrative purposes only.

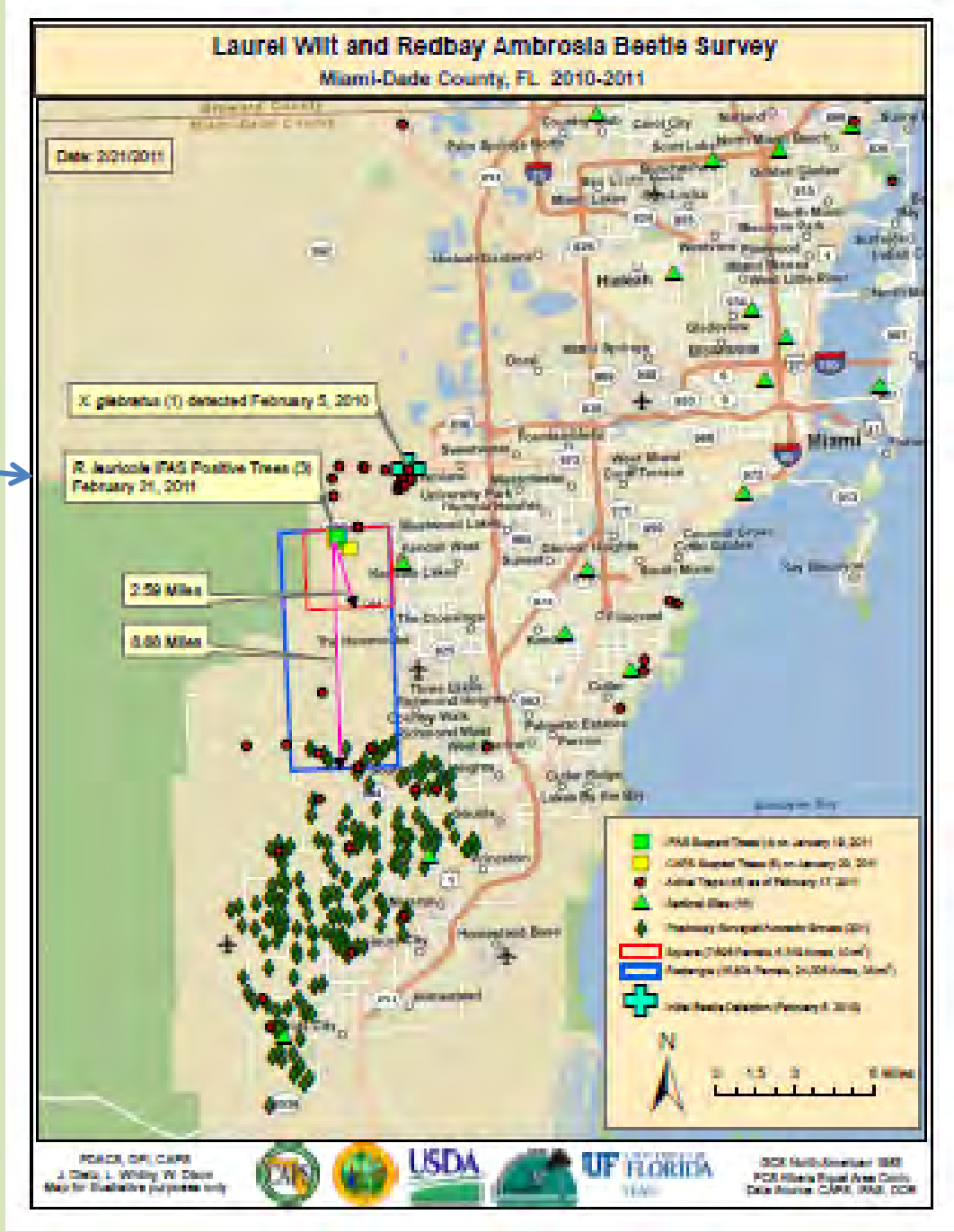
USDA

UF UNIVERSITY of FLORIDA IFAS

GCS North American 1983
PCS Albers Equal Area Conic
Data Source: CAPS, DEP, IFAS

Location of the LW positive swampbay trees

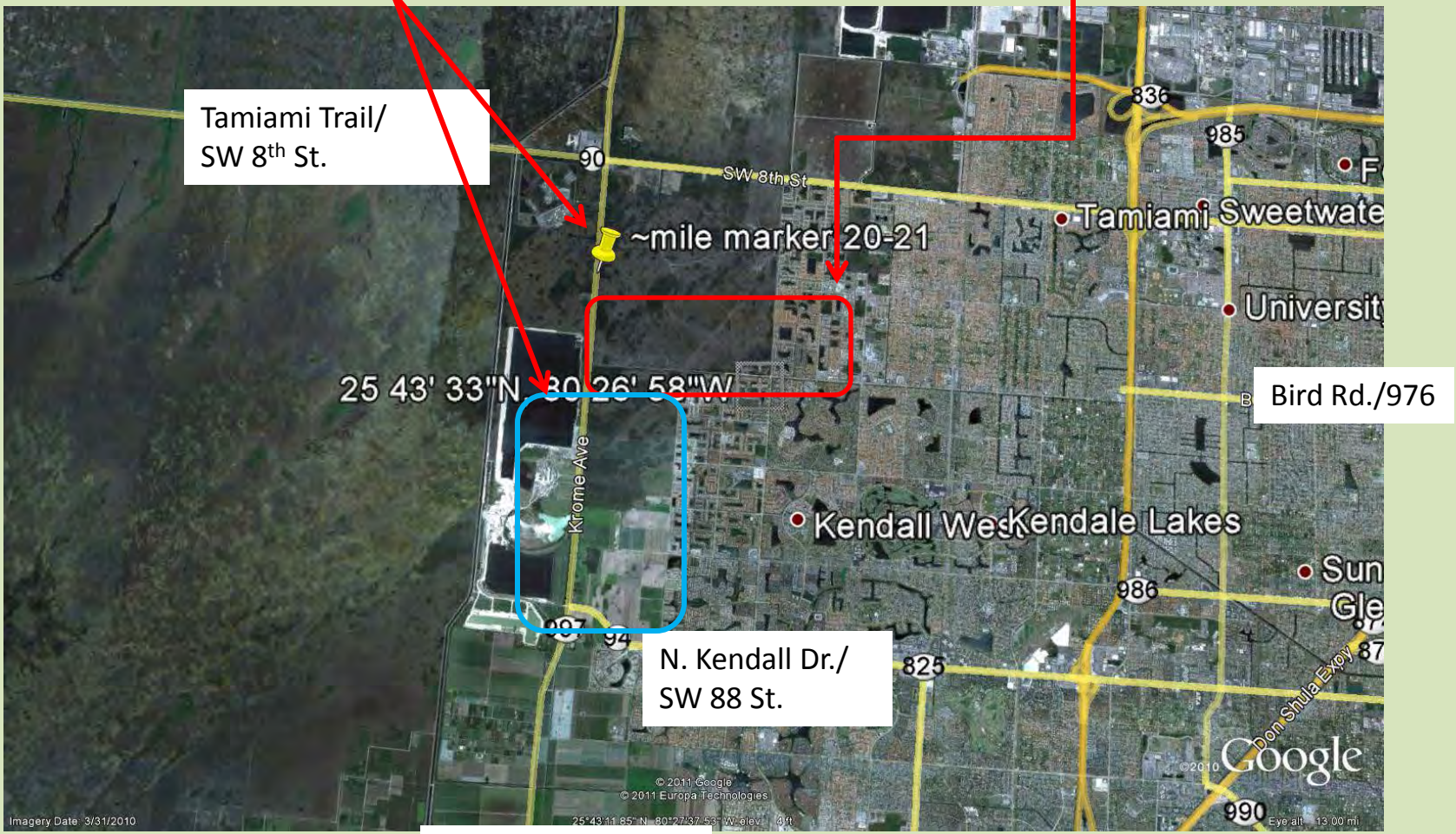
Tamiami Trail/
Rt. 41/SW 8th St.



General location of LW positive swamp bay trees

LW positive swampbay trees 2011-2012

Area of suspect swampbay trees



FDACS-DPI response plan

- Working with SFWMD
  - Helicopter survey of area
- DPI ground truth suspects
- DPI to change to sticky traps
  - Appear more effective
  - Verify vector presence
  - Access RAB population density
- Commercial avocado producers
  - Initially provide suspect samples to R. Ploetz and J. Smith
- Urban residents
  - Contact DPI
  - Samples go to DPI
- Outreach
  - Commercial producers
  - Urban residents

Redbay ambrosia beetle (RAB) (*Xyleborus glabratus)*

- Very small (~2 mm in length), brown-black colored, cylinder shaped

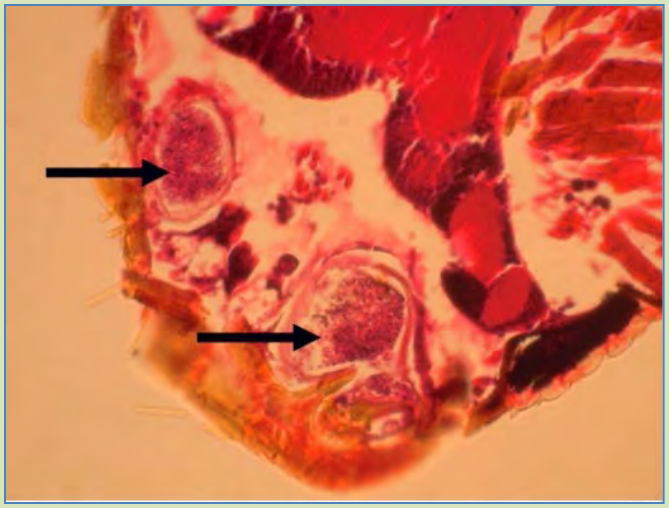
- Female beetles - most common and can fly; males – not common and cannot fly

- The RAB carries spores of the laurel wilt pathogen (LW: fungus) in special mouth pouches called mycangia

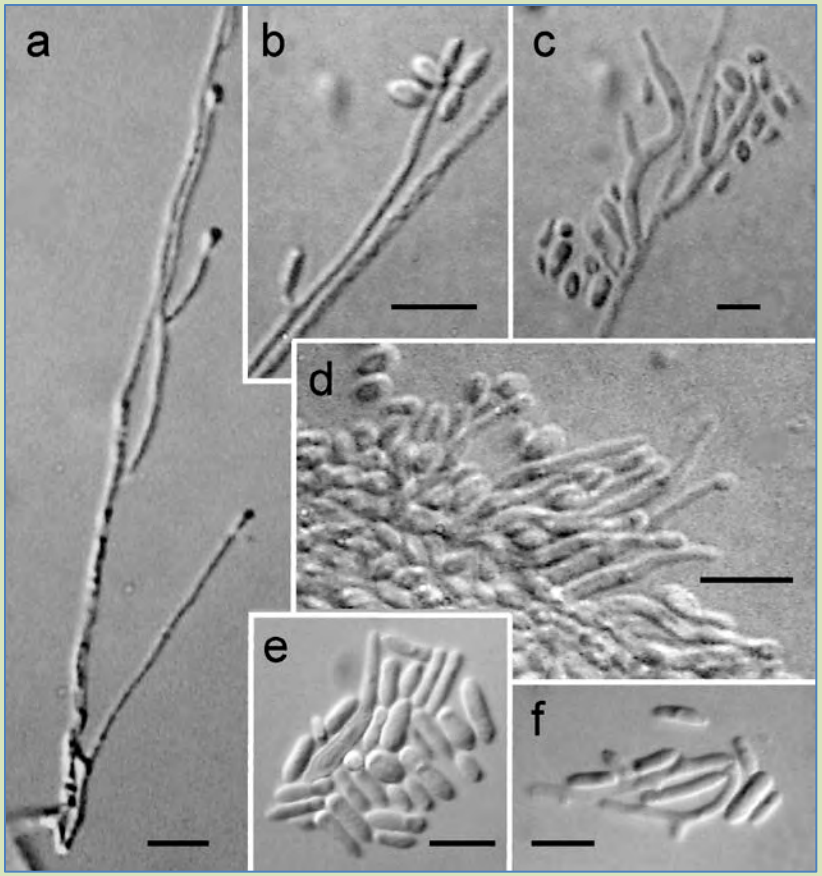
- Beetles bore into the wood just below the bark and form galleries in the sapwood

Laurel Wilt Pathogen (LW) *(Raffaelea lauricola)*

An exotic fungus



Mouth pouches on the beetle (mycangia) with LW spores



The laurel wilt pathogen

- The adult beetles and their larvae feed on the fungus

Research background

Redbay Ambrosia Beetle

- RAB generation time 40-50 days
- Chipping dramatically decreases RAB survival and emergence but not completely.
- RAB flight activity is greatest late afternoon-early evening.
- Most RAB flight at or below 15 ft.
- Number of RAB:other ambrosia beetles is extremely small.
- Damaged or pruned avocado wood is more attractive to RAB than non-damage/pruned wood for about a 3 week period.

Research background

Redbay Ambrosia Beetle

Redbay ambrosia beetle host preference

- silkbay>redbay=swampbay>avocado>lancewood

RAB odor preference

- Redbay>>avocado

> = greater than

LW spread

- Redbay ambrosia beetle (RAB)
- RAB infested wood
- Infested wood products:
  - Firewood
  - Mulch
  - Limbs and stumps of cut trees
  - Illegal dumping of infested wood
  - Infested trees in Lauraceae

Research background

Laurel Wilt Pathogen (LW)

- The molecular identification method for LW has been improved.
- The LW pathogen does not survive in the mulched wood chips.
- The LW pathogen does not appear to be transmitted by high-speed mechanical pruning equipment.
- The LW pathogen can be transmitted with hand saws (hand-powered) pruning saws.
- The visual external plant symptoms e.g., leaf wilting and stem dieback, of laurel wilt lag behind the degree of internal infestation and damage to the tree.
- The laurel wilt pathogen has <u>not</u> been demonstrated to move by root grafting from an infested avocado tree to adjacent avocado trees; although it is suspected this may occur.

Research background

Laurel Wilt Pathogen (LW)

- Preliminary data utilizing small avocado trees strongly suggests the reaction to (i.e., tolerance) to LW varies by genetic background (i.e., West Indian, Guatemalan, Mexican, and hybrids among these) and cultivar.
- In general West Indian and West Indian-Guatemalan hybrids appear to be less tolerant of LW than Guatemalan and Guatemalan-Mexican hybrids.
- Larger avocado trees are more affected by LW than smaller avocado trees.

Observations

Groves on Merritt Island

- Surrounded by dead and declining redbay trees
- Have not been decimated over a 3-5 year period by LW.
- Over a 2-3 year period while the redbay trees are being attacked there appears to be only random, limited attack of the adjacent avocado trees.
- There is a potential for this to change once the redbay population is devastated.
- Large mature trees have usually not died quickly but in sections over time (months to years).
  - For example, one or two major limbs would show external symptoms and others would not.

Summary

These research findings and observations suggest that

- RAB and LW has not quickly overwhelmed avocado groves in Merritt Island
- that RAB is more attracted to redbay and swampbay than avocado trees
- that chipping wood suppresses RAB
- LW does not survive in chipped wood
- RAB flight activity is highest during the late afternoon/early evening and most flight is within 15 ft of the ground
- Avocado may not be a “good” host for RAB reproduction
- All this suggest RAB suppression may slow the spread of LW.

Laurel wilt key points

- This is an insect vectored disease – not wind or soil borne.
- Only the redbay ambrosia beetle has been shown to transmit laurel wilt
- There is no proof that it moves through root grafts – although this may happen
- Early detection – scouting is key to reducing the beetle population and limiting the spread of the disease
- Laurel wilt does not infest other fruit trees besides avocado

Proposed control strategies

for urban environments

Purpose

- To reduce the RAB population in urban areas and suppress the spread of laurel wilt.

Key components

- Monitoring
- Disease identification
- Suppression – tree removal and proper disposal

Scouting and identification

- Frequent monitoring
  - Early detection
  - Opportunity for suppression of RAB-LW
- Identification of LW
  - Proper sampling
  - Submission of samples to DPI – verification of the disease
  - Decision on action

Scouting

Symptoms to look for

- Leaf and young stem wilting
- Leaf color change from green to dark green, bluish-green to greenish-brown.

Scouting

Symptoms to look for

- Dead leaves hanging on the tree
- Stem and limb dieback
- Commonly sections of the tree show symptoms and other sections do not.

Scouting and inspection

Symptoms to look for

- Inspection of the trunk and limbs
  - Dried sap
  - Sawdust (toothpicks)
  - Beetle entrance holes

Inspection and inspection

Symptoms to look for

- Remove the bark down to the sapwood and look for dark streaking.
- Dark streaks in the sapwood may indicate fungal infection. Normally this sapwood should be white to yellowish with no dark staining or streaking.
- Small, dark holes in the sapwood indicate wood boring beetles are present.

Who to contact if you have a declining tree?

- First ask the client to make sure the tree showing symptoms is a tree species in the Laurel Family: redbay, swampbay, and avocado
- Laurel wilt does NOT affect citrus, mango, etc.
- Call **Division of Plant Industry at 1-888-397-1517**
  - **DPI will send an inspector**
- Call the local **UF/IFAS Cooperative Extension Service** for more information and updates on laurel wilt

What can you do?

- *The State of Florida and local counties are not removing or cutting any urban residents trees that are affected or dead from laurel wilt*
- We do strongly recommend that the wood from redbay, swampbay, avocado and other host woody species in the Laurel Family should **not be moved** or sold as firewood, tree trimmings, BBQ smoke-wood, mulch, or wood-turning material.

What to do?

- *Why? Trees declining from laurel wilt are hosts for the redbay ambrosia beetle which spreads the disease laurel wilt.*
- We recommend urban residents contact their local waste disposal service or county government for directions on how to dispose of a dead or declining tree potentially infested with beetles that spread a lethal disease.

What to do?

- Tree disposal options will vary by county and local ordinances.
- Chemical control:
  - Native trees – fungicide treatments
    - Contact licensed and insured arborist for treatment costs
  - Avocado trees – no treatments recommended at this time
    - Research is on-going to determine treatment options

On-going research

- Plant pathology group
  - Chemical products and rates
  - Methods of application (e.g., flare root infusion, linkage with other products)
- Entomology group
  - Chemical products and rates (Section 18 Endigo®)
  - Repellents
  - Trap and kill

FDACS/DPI Helpline

888-397-1517

DPI links:

www.fl-dpi.com

http://www.freshfromflorida.com/pi/enpp/pathology/laurel_wilt_disease.html

s a v e t h e g u a c . c o m

UF/IFAS Extension offices:

http://solutionsforyourlife.ufl.edu/map/index.html

UF/IFAS publications: http://edis.ifas.ufl.edu

UF/IFAS Tropical Research and Education Center:

http://trec.ifas.ufl.edu