Laurel Wilt in Forests: After the “First Wave”

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Critical Questions

• What happens to *Xyleborus glabratus* and *Raffaelea lauricola* after nearly all large Lauraceae have been killed?
• Do they persist in the environment?
• If so, what are they using for hosts?
  – Smaller trees, resprouts and regeneration?
  – Alternate host species?
• What are the long-term prospects for the survival of native Lauraceae?
Early Observations: Larger-diameter redbays killed quickest, smallest-diameter trees often remain.
(extended from dataset used in Fraedrich et al. 2008)

Seedlings & Juvenile trees less than 1” DBH were rarely killed
(1 out of 222 monitored)
RAB population decline over time?

Redbay ambrosia beetle flight activity, Ft. George Island, FL
Hypotheses/Expectations:
In areas ~9 years post-invasion, as compared to recently-affected areas:

• The RAB will still be present, but at very low levels.

• RAB will be more likely to attack small-diameter host trees in the absence of large ones.

And:

• Trees < 1” (2.54 cm) DBH do not serve as effective brood material.
Selected “old” and “new” sites.

- **Old**: long-infested, all large host trees now gone (Duval County).
- **New**: currently active, with many large redbay trees, both alive and dead/dying (Alachua, Suwannee).
Methods

Trapping Grids:
• 5 reps of 5 different lures (+control) with sticky traps, for 7 weeks, at “old” and “new” sites (1 each).

Juvenile sampling:
• Measured abundance/distribution juvenile and seedling redbays along 100-meter transects
• Collected all dead/wilted juveniles ≤ 6 cm DBH within plots 200 meters in diameter.
  • Excavated galleries – recorded presence of RAB, especially larvae, pupae, callow adults, and males (evidence of breeding)
• Cultured for Raffaelea lauricola.
Trapping survey: RAB still present on “old” site, but at very low numbers (8 beetles over 7 weeks)
Juvenile population sampling:

- Smaller juveniles and seedlings still present at old sites
- Trees >2 cm DBH are not abundant at old sites.
Some surprises:

• Could not find any infested/infected juveniles in or around the “old” site plots (28-49 found in “new” site plots)
• Dead saplings ≤ 2 cm fairly common in “new,” actively-infested areas (18 found in plots).
  • Recovered *R. lauricola* from 57%.
  • Adult RAB found in 40%.
  • Clear evidence of breeding found in 10%.
• Most extreme example: male RAB recovered from 0.9 cm (dbh) sapling.
Possible Interpretations

• Small-diameter trees are mainly at risk where the RAB population is high. (corroborated by Maner et al. 2014)

• The long-distance host-detection behavior of RAB may be less targeted, and more random than expected.

• Trees surviving after RAB population drops may persist for long periods.
Special Thanks To:
Dr. Lukasz Stelinski, UF-CREC
Dr. Wendy Meyer, UF-CREC
Chris Pearce and Stephanie Ley, FFS