

ARS scientists devising new ways to protect avocados

October 3 2012, by Dennis O'brien



During field trapping studies at Lake June State Park in central Florida, entomologist Paul Kendra sets up a sticky panel trap baited with an essential oil lure for evaluations of attractants for redbay ambrosia beetle. Credit: Stephen Ausmus.

U.S. Department of Agriculture (USDA) scientists are coming up with new strategies to combat a beetle threatening the nation's avocado trees.

Laurel wilt disease is caused by the fungus *Raffaelea lauricola*, and is vectored by the redbay ambrosia beetle, an invasive pest from Asia that has spread to the Carolinas, Florida and west to Mississippi. The disease kills 90-95 percent of infected [trees](#). Scientists are concerned that it will soon reach Mexico and California, which are major [avocado](#) production areas. Its victims also include several other types of laurel trees.

Paul Kendra and his colleagues at the Agricultural Research Service (ARS) Subtropical Horticulture Research Station (SHRS) in Miami, Fla., are working to minimize the threat. They are searching for chemical attractants for beetle traps, treating trees in the ARS avocado collection with fungicides to slow the spread of the disease, and shipping trees from the Miami avocado germplasm collection to disease-free sites.

ARS is USDA's principal intramural scientific research agency, and this research supports the USDA priority of promoting international food security.

Previous research has shown that like other [bark beetles](#), the redbay [ambrosia beetle](#) essentially "sniffs out" [volatile compounds](#). In [field experiments](#), the researchers compared the number of redbay ambrosia beetles attracted to manuka oil lures, phoebe oil lures, and bolts of [wood](#) cut from lychee and from the three races of [avocado trees](#). The trials were conducted at a Florida conservation area where the beetle has infested trees since 2007.

In laboratory tests, the researchers also conducted "choice" experiments by placing lychee and avocado wood on opposite ends of a plastic bin and placing the beetles in the middle to see which wood they preferred. Compounds released by the two types of wood were analyzed using gas chromatography-mass spectroscopy (GC-MS).

Results published in the *Journal of Chemical Ecology* showed that the beetles had no strong preference among the three avocado races, and that lychee was the most attractive wood. Of the 29 compounds detected, three were found to attract the beetle and the lychee had large amounts of all three.

Subsequent research also showed that the phoebe oil lures were effective for 10 to 12 weeks, but the manuka lures lasted only about 2 to 3 weeks.

Knowing how long the manuka lures work should prove useful to Florida agriculture officials, who use them in monitoring efforts. Officials and growers will also benefit from the researchers' discovery that the beetles prefer freshly cut wood surfaces, a finding that helps growers realize trees are vulnerable to attack during pruning.

More information: www.springer.com/life+sciences+ecology/journal/10886

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