

NEWS RELEASE

New method may help detect avocado pathogen earlier

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GAINESVILLE, Fla. --- University of Florida researchers have found an algorithm to help them detect laurel wilt, the deadly pathogen that threatens Florida's \$100 million-a-year avocado industry.

Reza Ehsani, an associate professor of agricultural and biological engineering, said the algorithm finds laurel wilt-infected avocado trees before symptoms are visible to the naked eye. About 500 growers produce Florida's avocado crop annually, and more than 98 percent of the fruit is grown in Miami-Dade County. UF scientists estimate laurel wilt could severely reduce the commercial avocado industry if they don't find control strategies for the pathogen and ambrosia beetles.

UF scientists already know they can find infected trees through camera images taken from small planes at low altitudes.

In the study, published in the journal *Remote Sensing of Environment*, scientists determined the parameters necessary to take the image as well as the factors needed to develop and use the algorithm, said Ehsani, who works at the UF Institute of Food and Agricultural Sciences Citrus Research and Education Center in Lake Alfred.

Ehsani and his postdoctoral research associate, Ana de Castro, worked on the study with professors Jonathan Crane and Randy Ploetz from the UF/IFAS Tropical Research and Education Center in Homestead and the Avocado Administrative Committee's administrator, Alan Flinn and their Laurel wilt Coordinator, Don Pybas, in Homestead, where the study was conducted.

Researchers will take aerial photos and use the algorithm to analyze the images and create a map that shows the infected avocado tree.

“Knowing the location of infected trees at early stage is very critical in controlling and managing the disease,” Ehsani said. “The goal here was to find the optimal flight height that reduces the flight duration while maintaining the accuracy of detecting infected trees.”

Geometric parameters defined the optimum flight altitude, Ehsani said. Flight altitude defines the image resolution, and there is a tradeoff between image resolution and accuracy. Flying too low provides higher resolution and better accuracy in detecting the infected disease, but it also adds to the flight duration and overall costs of obtaining the aerial image.

The ambrosia beetle, which transmits laurel wilt, was discovered in the U.S., in Georgia, in 2002 and the link between the beetle and the fungal pathogen was made in 2003. The devastating disease has spread rapidly through the natural landscapes along the southeastern seaboard of the U.S. and has begun to slightly affect commercial avocado production in Florida.

Laurel wilt is spread by ambrosia beetles and among avocado trees through their interconnected roots of avocado trees. The time from infection to tree mortality ranges from four to eight weeks. To prevent spread of the disease, it is important that trees be destroyed as soon as they are affected by the disease.