Florida Citrus Advanced Technology Program

QUARTERLY & FINAL REPORTS: Control of Citrus Greening, Canker & Emerging Diseases of Citrus

Instructions Complete the fields based on your project specs. When finished, save the form to your local disk using a unique name. Then, go to **http://research.fcprac.com**, and log in with your user name and password using Researcher Login in the lower left. Find this project title and click on **Submit a Report**. Update your profile information if needed, then upload this report as directed.

2009-2010 REPORT	CATEGORY (drop-down)	TODAY'S DATE (m/d/yr)
○ *Quarterly Report* ○ *Annual Report* ◉ *Final*	Management	4/14/10

WHAT IS THE "HEADLINE" FOR THIS REPORT (e.g. a one-sentence "newspaper headline" describing what you accomplished)

Assessment of Canine Detection for HLB and Citrus Canker

TITLE and CONTACT INFORMATION

Proposal Title Assessment of Canine Detection for HLB and Citrus Canker.

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Phone 772-462-5883	*Project Duration (years)* 1 *Year of Project* 1
Organization USDA, ARS	*Total Direct Funds (current year)*

REPORT UPDATE (650 words; provide details about your headline)

Our initial efforts in using canines to detect canker started in 2000 but were thwarted by the September 11 attack on the US, which permanently diverted the canine we had been training (it was included in the much needed efforts to detect explosives). However, prior to this dog's reassignment, our initial research with canines for canker detection demonstrated their ability to detect citrus and citrus canker volatiles/aromas/essences, i.e., minute concentrations of volatile/aromatic compounds, deposited on cloth and other materials as well as directly from the air. A second attempt with USDA, APHIS agriculture detector dogs was cut short by decreasing budgets combined by increasing needs of detection of contraband agricultural products at points of entry into the US. However, our third and ongoing attempt has been much more successful. This most recent canine, 'Juice', has demonstrated an ability to detect canker infected citrus fruit with high reliability.

The initial success of this project with regards to canker detection, suggests that the same technique may be useful for detection of HLB, perhaps presymptomatic while the disease is still latent. Such a tool would be very useful and is much needed, as it would allow both detection and early removal of presymptomatic (latently infected) trees, which also may be below the titer required for psyllids transmission.

Two dogs have been trained to recognize the scent of citrus canker. Dogs were trained on infected versus non-infected trees and fruit. Training of the canines for the detection of canker infected citrus trees was accomplished via a commercial canine training facility in North Florida. As indicated above, 'Juice', demonstrated an ability to detect canker infected citrus fruit with high reliability (> 99.3%). Juice was capable of discriminating canker infected from non-infected fruit in 30 runs of 5 blind stations each, with only one false positive and no false negatives (Peruyero and Gottwald, unpublished). Results indicate that canines can detect and differentiate citrus fruit infected with canker from non-infected tissues.

The canine was then trained on infected versus non-infected Duncan grapefruit seedlings. Preliminary tests at the canine training facility are very promising. Field trials were conduced in early April at the USHRL farm. Trees (75) were placed in the field in a 3 row by 25 tree/row design. Ten replications were conducted in which the proportion of disease trees ranged from 2-10%. The conditions were sunny but with a 15-20 MPH breeze. Even so, detection highly reliable. Data are presently under analyses. Short movie footage was also taken to document the dogs search and detection behavior. More field trials are scheduled over the next few months to validate the canine's performance.

At the conclusion of the canker field testing (proof of concept) the dog will the be cross-trained for HLB detection and field tests will be conducted to assess performance and detection ability to HLB. This will go beyond the time frame of this grant, but we will pursue it to conclusion utilizing USDA, ARS funding internal.