# 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 | 10/15/09 |

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

Horticultural Approach to Maintaining Citrus Trees with HLB

**TITLE and CONTACT INFORMATION**

*Proposal Title* Cultural Practices to prolong productive Life of HLB Infected Trees and Evaluation of Systemic acquired Resistance Inducers Combined with Psylllid Control to Manage Greening NAS179

| | |
|---|---|
| *Principal Investigator* Robert Rouse | *PI Last Name* Rouse |
| *Email* rrouse@ufl.edu | *FDACS Contract Number* 00070950 |
| *Phone* 239-658-3400 | *Project Duration (years)* 3 *Year of Project* 1 |
| *Organization* UF/IFAS | *Total Direct Funds (current year)* 214,881.00 |

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

Primary: Cultural Practices to prolong productive Life of HLB Infected Trees

The first objective of the project has been accomplished. This objective was to duplicate at another site the positive results using nutrient/SAR foliar sprays to rejuvenate HLB infected trees seen in citrus grower Maury Boyd grove. We have seen a rejuvenation of heavily infected HLB trees using the foliar spray mixture of micronutrients (Mg, Zn, Mn, Mo), SARs (Salicylic acid, Serenade Max WP), Phosphorous acid, Hydrogen peroxide, and other macronutrients applied with citrus spray oil. These results have been seen in three randomized & replicated trial sites of 6 to 7-yr-old Valencia orange trees. Initial infection rates among the trials ranged from 100% infection at IFAS Immokalee site, to 50-60% infection in one commercial grove, and 15-20% infection in another commercial grove. In 2009 all possible combinations of the component groups were applied to the spring, summer, and fall vegetative flushes at each site with similar positive results.

After applications to the 3 flushes in 2008, and during the drought in the spring of 2009, the trees produced vigorous flushes with normal internodes and large leaves. Flowering resulted in set fruit with a normal to large crop on trees that did not produce a harvestable crop in 2008. To date the crop has held on the trees with very little fruit drop. Although the trees are symptomatic of HLB they have continued to flush vigorously through the summer. New growth has regenerate from below the dieback on twigs with dieback. A dramatic recovery has been apparent in many of the treatments.

Most treatments improved tree condition and the best results are apparent with the complete mixture. The macro and micro nutrients seem to be the most important. Fruiting appears to be enhanced with the addition of the Phosphorous acid and SARs.

Yield from the 2008 Valencia crop from 7-yr-old trees harvested in summer 2009 at the 30-acre-commercial showed yield highest in the treatment containing macro & micro nutrients, Phosphorus acid, and hydrogen peroxide (0.80 box/tree). Yield was least in the treatment containing macro nutrients and hydrogen peroxide (0.43 box/tree).

A spreadsheet has been developed and will be posted on the SWFREC website that calculates the net present value of grove returns over 10 years assuming production and price assumptions that the grower can input. The spreadsheet allows a grower to determine the threshold rate of tree removal after which an alternative nutrient management program for greening infected trees would return a higher net present value.

Subcontract: Evaluation of Systemic Acquired Resistance Inducers Combined with Psyllid Control to Manage Greening in Infected groves

In a 12-acre commercial block of Valencia oranges 7-years-old trees we evaluated the effect of micronutrients + systemic acquired resistance (SAR) inducers, and their interaction with psyllid chemical control. With 4 replicates in an RCB design for a 2x2 factorial experiment with two main effects: 1) 3 applications a year of micro-nutrients + SAR at two levels (Yes or No) and 2) insecticide applications based on scouting at two levels (Yes or No). Plant tissue, ACP adults, and nymphs (when available) are collected for PCR analysis every 4 months and results plotted and evaluated using quantitative geostatistical analysis. Incidence of positive trees was 33% in November 2008 and April 2009 and their distribution did not change over the two dates. With respect to the ACP, our results indicate significant differences in populations between insecticide-treated and untreated trees throughout the year, which maintained differences up to 26X despite close proximity. In contrast, the micro+SAR treatments are not having an effect on psyllid populations.