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*	HLB Pathology	6/23/09

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

After a year of experimentation, we accomplished all four original objectives and goals.

TITLE and CONTACT INFORMATION

Proposal Title Development of Detection Methods for Greening in Citrus

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Phone	*Project Duration (years)* 1 *Year of Project* 1
Organization UF-CREC-IFAS	*Total Direct Funds (current year)* $40,000

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

Objectives: 1. Establish the proper protocol in terms of sampling technique, iodine solution, and parameters to be used for visual detection. 2. Analyze starch accumulation patterns in symptomatic and asymptomatic leaves from trees infected with Citrus greening. 3. Determine any limitations based on varietal differences. 4. Distinguish between greening and other biological diseases and horticultural deficiencies in terms of starch staining.

After a year of experimentation, we accomplished all four original goals listed above.

1. Establish the proper protocol in terms of sampling technique, iodine solution, and parameters to be used for visual detection. A protocol was established that maximizes the visualization of leaf starch accumulated as result of HLB infection. The method, based on iodine staining, was tested and appears to be equally effective in all varieties and cultivars investigated. Published by IFAS EDIS publications, the test is now widely used to detect suspicious HLB trees.

2. Analyze starch accumulation patterns in symptomatic and asymptomatic leaves from trees infected with HLB. For the most part, there was a direct correlation between yellow HLB symptom patterns and starch accumulation. This rule seems rather universal and fails only in the leaf pattern known as "green islands", where starch seems to accumulate in random pockets. Asymptomatic leaves collected from branches already containing symptomatic leaves usually show a high degree of starch accumulation. Sometimes, the amounts of starch are visually indistinguishable from symptomatic leaves in the same branch. On occasion, there are asymptomatic and starch-less leaves mixed within symptomatic starch-laden leaves.

3. Determine any limitations based on varietal differences. From the extensive studies conducted throughout one year, we detected 2 circumstances where the starch test may not be as accurate. One, Murcott oranges seem to have a natural high base level of starch that makes the process of decision making at low and intermediate levels more difficult. Second, acid limes do not appear to follow a consistent pattern of starch accumulation in leaves. Although the numbers of samples has been small, we can not at this time recommend the iodine test on acid limes or lemons.

4. Distinguish between greening and other biological diseases and horticultural deficiencies. The only cultural practice with potential effect on starch accumulation is Zn deficiency-induced starch accumulation, albeit lower levels. These low levels are comparable to those found in Murcott. However, since Zn deficient presents characteristically different symptoms from HLB, this should not present a problem. No other disease common to Florida citrus resulted in starch accumulation.