# 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 | 6/17/10 |

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

Only local inoculum removal and vector control is not enough to achieve success on HLB management

**TITLE and CONTACT INFORMATION**

*Proposal Title* Reduction of bacterial inoculum and vector control as strategies to manage citrus huanglongbing (greening)

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| *Phone* (+55) 16 3301-7025 | *Project Duration (years)* 3 *Year of Project* 1 |
| *Organization* Fundecitrus | *Total Direct Funds (current year)* $49,000.00 |

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

During this first year data were collected from this field experiment (Exp.1) and its results have been compared with the results of other similar experiment (Exp. 2). While Exp.1 have been carried out in a region with high external inoculum pressure because of its proximity with groves without HLB management, Exp.2 is in a region with lower external inoculum pressure, located in the middle of a large farm with regional disease management. In Exp.1 the disease epidemics started 13 months after planting, while in Exp.2 it started later, 22 months after planting. Also in Exp.1 the cumulative incidence of HLB-symptomatic trees and cumulative number of caught adults ACP in plots without vector control was 72.5% and 319, respectively, after 48 months after planting, against 4.2% and 99, respectively, for Exp.2. This preliminary results showed the great effect of regional management of HLB (In the case of Exp.2, at least 4 inspections/removal of symptomatic trees and 6-8 insecticide sprays per year in the area up to 2 km surrounded the experimental area). Differences on the time that a symptomatic tree remained exposed in the field before be eliminated were observed among different frequencies of local inoculum reduction. However, such differences did not result in significant differences on HLB progress rate and HLB incidence 48 months after planting among different frequencies of local inoculum reduction in each experiment. The tested program of ACP in Exp.1 has been efficient to reduce the number of adult psyllids captured on yellow stick traps in 81% and to reduce the number of eggs and nymphs observed on new shoots in 95%. However this vector control reduced HLB-incidence in only 40%. The disease progress rate (estimated by Gompertz model) in plots with ACP control program was significantly reduced in 27% compared to the disease progress rate in plots without ACP control (Average Gompertz rate of 1.35 for plots without vector control and 0.99 for plots with vector control). From December/09 to May/10 the disease incidence increased from 28.9% to 43.8% in plots with ACP control program and from 61.8% to 72.5% in plots without vector control. For Exp.1, all psyllids captured on yellow stick traps from the winter/07 to winter/09 were tested for the presence of Candidatus Liberibacter spp. by conventional PCR. PCR-positive ACPs have been observed during spring/07 (1.8% of tested samples), summer/08 (2.1%), spring/08 (4.5%), summer/09 (10.2%), fall/09 (48.1%), and winter/09 (28.6). Infective ACPs were found both in plots with and without vector control program, respectively 6.3 and 7.5%. Samples from spring/09 to fall/10 are being processed. However, no psyllid sample was positive for Candidatus Liberibacter spp. in Exp.2. This result could explain why even with similar population of adults ACP in plots with vector control, the incidence of HLB-symptomatic trees were much lower in vector controlled plots of Exp.2 (3.1% in Exp.2 and 43.8% in Exp.1). Annual maps of HLB-symptomatic trees were prepared for spatial analysis using stochastic models (MCMC) to verify the effects of each treatment on primary and secondary spread of HLB. This analysis is being done at USDA lab in Fort Pierce by Gottwald's team. So far, it could be comment that recommended HLB management for new groves is much effective under low pressure of external inoculum and that only local disease management could be not enough to control HLB in a region with high external inoculum pressure, as is the case of Exp.1. The assessments on both experiments will continue at least for one more year to allow more detailed temporal and spatial analysis, as well economical analysis, and get final conclusions. These and others preliminary results were presented in four seminars given in CREC, Florida Citrus Show, Syngenta Experimental Station, and Florida Natural's in the last week of January/10. Also, they were present in three Brazilian events: 3rd Huanglongbing Day (March/10), 2nd National Conference on Agriculture Protection (May/10), and 32nd Citrus Week (June/10).