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	6/18/10

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

All three proposed experiments have begun and waiting for incubation period.

TITLE and CONTACT INFORMATION

Proposal Title Comparative epidemiology of citrus huanglongbing (greening) caused by Candidatus Liberibacter asiaticus and Ca. Liberibacter americanus

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Organization Fundecitrus	*Total Direct Funds (current year)* $83,825.00

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

All experiments have been carried out under insect-proof conditions. After solve problems regarded to inoculum sources (Citrus and Murraya with CLas and CLam) and ACP rearing and transmission protocols, all experiments are already established and we are now waiting for symptoms appearance. Exp.1 - On the contrary of our thought, the species of Murraya we have in Brazil is not M. paniculata but M. exotica according to the description and illustration made by Huang 1959. Exp.1 began in April/08. The first diseased plants appeared in samples of October/08 for CLas from citrus source. Real time PCR of the samples collected in January/09 indicated that ACP had transmitted CLam from Murraya and from citrus inoculated with CLam to other citrus plants. Also, it was observed the predominance of diseased plants with positive conventional PCR for CLas in the two compartments where citrus plants served as primary source of inoculum of CLas and CLam. Although bacterial source plants infected with CLam showed more severe symptoms than plants infected with CLas, real-time PCR detected 14 and 5 plants with CLas in compartment 1 and 2, respectively, while no CLam infected plant was detected yet. Compartment 2, that received more sun light, had more nymphs and adults ACP than compartment 1 (19,088 against 4,033). Collected psyllids samples in compartment 1 and 2 were PCR positive only for CLas with infectivity varying each assessment from 0 to 50%.There were 8 plants with CLam (infected and symptomatic) in compartment 4, where Murraya served as source of inoculum and no plant with positive for CLam in compartment 3, where citrus served as inoculum source. The number of ACP (adults and nymphs) was higher in compartment 4 (20,357) than in compartment 3 (2,685) with higher rearing on infected Murraya than on infected Citrus). It was the first time that the transmission of CLam from M. exotica to citrus by ACP was observed and a note will be published in Journal of Plant Pathology. In December/09 we stopped to release new ACP and killed all psyllids present in the compartments. All plants were moved to other insect-proof screenhouse and will be there for symptoms observation and leaf sampling for PCR analysis. New inoculum source Citrus and Murraya plants are being prepared to repeat this experiment. At this time we want to include sources of Murraya infected with CLas. Exp. 2- The delay to start this experiment was caused because took so long to obtain inoculum source plants for CLam, but this problem was already solved. During January/10, ACP was reared on symptomatic inoculum sources for CLam and CLas. The emerging adults from nymphs reared on such inoculum sources were used for inoculation in March/10. After the inoculation, adults of ACP free of Liberibacters will be periodically feed on these inoculated plants to detect the moment when they can acquire the bacteria from inoculated plants. Exp. 3 - aims to quantify and compare the HLB symptoms progress in sweet orange cultivars (Hamlin, Pera and Valencia) infected with CLas or CLam by D. citri at different ages (planted in 1999, 2004 and 2006). Nine insect-proof screenhouses were built in a commercial citrus farm (6 in Dec/08 and 3 in Dec/09). Each screenhouse covered 15 trees and monthly assessments looking for the presence of HLB associated bacteria in each protected tree by real time PCR were done before inoculation and unfortunately in each screenhouse the CLas were detected in few trees. Plants from Hamlin and Valencia were already inoculated at the beginning of July/09 with Clas and Clam infected adults ACP and plants from Pera were not inoculated yet, because some of screenhouse suffered some wind damages. Monthly assessments for symptom severity have been done, but no HLB-symptoms were observed yet on inoculated trees. Also, leaf samples have been collected to detect the presence of Liberibacter species on inoculated shoot. To accelerate the results of this experiment, new trees showing very low symptoms severity will be selected in farms without removal of symptomatic trees but with strong ACP control program.