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*	Genetics	10/20/09

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

TITLE and CONTACT INFORMATION

Proposal Title Engineering Resistance Against Citrus Canker and Greening Using Candidate Genes

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Phone 352-392-3631x344	*Project Duration (years)* 3 *Year of Project*
Organization UF-Department of Plant Pathology	*Total Direct Funds (current year)* 84,313.00

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

The goal of this project is to transform the Arabidopsis and citrus NPR1 genes (CtNPR1 and AtNPR1), and the rice XIN31 gene into citrus, and to evaluate their resistance to both citrus canker (caused by Xanthomonas axonopodis pv. citri (Xac)) and greening diseases. The first year objectives include: (1) Molecular characterization of the transgenic plants; (2) Inoculation of the transgenic plants with Xac. (3) Inoculation of the transgenic plants with the HLB pathogen and monitoring of the bacterium in planta with quantitative PCR; (4) Transformation of SUC2::NPR1 into citrus; (5) Plant maintenance. Overall the project is going very well. Among the PCR positive plants (see the progress report submitted on July 15, 2009), we have identified three transgenic lines overexpressing CtNPR1 and AtNPR1, respectively, by using Northern blot analysis. These NPR1 overexpression lines were inoculated with a strain of Xac and the results showed high levels of resistance from the NPR1 overexpression lines, but not from the control plants, suggesting that both CtNPR1 and AtNPR1 are functional in citrus resistance to canker disease. We are currently performing growth curve analysis to confirm our observations and also comparing the function of CtNPR1 and AtNPR1 by inoculating the plants with different concentrations of Xac inoculum. In addition, we have also grafted the six NPR1 (three each of CtNPR1 and AtNPR1) overexpression lines and the control onto more root stocks to propagate the transgenic population. Our goal is to produce more than ten individuals for each line. These plants are maintained in green-houses located at the Citrus Research and Education Center in Lake Alfred, and will be used for greening inoculations starting next month.