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	1/15/10

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

Mature sweet orange varieties from Florida and Carrizo citrange are being readily transformed.

TITLE and CONTACT INFORMATION

Proposal Title Development of transformation systems for mature tissue of Florida varieties, and strategies to improve tree management

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Organization IVIA/CREC	*Total Direct Funds (current year)* $488,000

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

Progress on first year's objectives:

1) Build a greenhouse in Florida for growing citrus for mature transformation.
The preliminary planning work to build the greenhouse for growing citrus for mature transformation was completed. It included a detailed analysis of all project components and necessities. Conceptual designs were fully developed to allow for a more accurate estimate of project costs. A first estimate showed that the initial project is over budget. Modification of the initial project is underway to adjust the budget by redesigning the greenhouse and/or looking for additional funds.

2) Training of the Florida manager (Dr. Zapata) at IVIA in Spain.
Dr. Cecilia Zapata arrived to the IVIA in November 11th to learn the technology to transform mature citrus. Several transformation experiments were set up with Valencia, Hamlin and Pineapple sweet oranges and Carrizo citrange, and screening of putative transformed plants regenerating from the in vitro cultures is underway. She has been trained in all tissue culture techniques associated with citrus transformation, with preparation of the source plant material at the greenhouse, and with acclimation of transformants to the greenhouse. Parallel to this, she is learning how to start and maintain a greenhouse to support a mature transformation facility.

3) Establishment of genetic transformation systems for mature materials from the most important sweet orange varieties grown in Florida and Carrizo citrange rootstock.
Mature Valencia sweet orange is being routinely transformed, as well as Pineapple, at the IVIA. Randomly chosen transgenic lines coming from different experiments are being transferred to the greenhouse to follow their growth and flowering-fruiting response. Hamlin is being more difficult to transform, but we are learning to prepare the starting materials properly and adapting the tissue culture media and procedures to this genotype. Although we did not get any transformant yet, many experiments are running and the aspect of the cultures and regenerating shoots is very promising. Regarding Carrizo citrange, we are just getting the first putative transformants.

4) Strategies to improve tree management.
We have decide to focus so far in the overexpression of flowering time genes for generating new orange types putatively more compact and productive. 25 sweet orange seedling transformants with CsFT and 7 with CsAP1 have been obtained. In less tan one year, 68% of CsFT plants and 14% of the CsAP plants have produced flowers. They are being characterized at the phenotypical and molecular level. In order to compare this with the effect of overexpression of the same flowering genes in other citrus types, we have genetically transformed juvenile Carrizo citrange explants with the CsFT and CsAP1 genes. All these experiments are under way in greenhouse and tissue culture phases, respectively.