# CITRUS ADVANCED TECHNOLOGY PROGRAM

**QUARTERLY & FINAL REPORTS:** Control of Citrus Greening, Canker & Emerging Diseases of Citrus

▶ INSTRUCTIONS

○ *Quarterly Report* ◉ *Annual Report* ○ *Final*

Required: What is the "headline" for this report (e.g. a one-sentence "newspaper headline" describing what you accomplished)

## The growth room for transformation is not fully operative yet

Proposal Title

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

| Today's Date | Sponsoring Organization (drop-down) | Category (drop down) |
|---|---|---|
| 9/5/11 | Citrus Research and Development Foundation | Transgenic/Metagenomic Mediation of Resistance |

**REPORT UPDATE** (500 words; summarize your accomplishments )

In our initial schedule, the mature transformation facility (lab and greenhouse) at the CREC in Lake Alfred had to be implemented during the first year of the project. An existing laboratory was modified to fulfill the requirements of a tissue culture facility. The laboratory is now fully operative. Regarding the greenhouse, it became impossible to accommodate the budget to our plans for constructing the outstanding facility we requested. Alternatively, a growth room was designed profiting an existing structure at the CREC. The growth room construction was initiated in October 22nd 2010. The projected date of completion was February 11th 2011. Technically it was finalized by mid-April, however there were several technical/operational problems that came out during the following 4-5 months, especially regarding the refrigeration system (environmental conditions were not estable; some air handlers were not producing the air the manufacturer claims, in some cases the thermal expansion valve was changed because it was defective, air filters were not the ones we requested and they were changed, the humidifier in the small room is not located in the appropriate place for working properly), computer program (growth room technician still doesn't have access to the program though this is currently being solved), water elimination after irrigation is defective, soil sterilizer (it needs a special accommodation to work "safely"). A generator should be purchased; without it, any prolonged electricity cut could jeopardize the whole project.

The manager from Florida (Dr. Cecilia Zapata) completed her training in Spain during the first year, moved to Florida and has been working hard to set up the mature transformation facility at the CREC during the whole second year. Two part time OP technicians were hired to work on tissue culture and on plant preparation and a third OP technician was hired to work care at the growth room, under the supervision of the manager (and the PI at the initial stage). Another technician has been recently hired to help in the growth room and the lab because one of the OP technicians is leaving soon due to personal reasons. The Spanish lab has been monitoring the progress of the Florida facility. The PI and his manager at the IVIA greenhouses traveled to Florida last March 2011 to supervise the growth room construction and to set up healthy citrus germplasm bank establishment. The PI and his greenhouse manager will travel again to Florida next October 2011. An IVIA scientist with experience in mature citrus transformation will travel to Florida to help setting up the facility tentatively next November 2011. It is programmed that the IVIA scientist will spend three months in Florida (November 2011-February 2012).

In Spain, mature tissues from the three sweet orange types (Hamlin, Pineapple and Valencia) plus Carrizo citrange were readily transformed.

For our second objective, improving citrus tree management, we proposed to over-express flowering-time genes in both the Carrizo citrange rootstock and the Pineapple sweet orange scion. We have now at least ten independent transgenic lines of Pineapple sweet orange and Carrizo citrange over-expressing either CsFT or CsAP1 flowering-time genes already established in the greenhouse. We have characterized these transformants at the molecular level and continue characterizing them phenotypically in detail in the greenhouse. Moreover, for generating a dwarf-dwarfing rootstock, we have incorporated a construct aimed to induce RNA interference to downregulate the expression of a crucial gene in gibberellin biosynthesis, CcGA20ox1, in mature Carrizo citrange.


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*Organization* IVIA


*Contract Number* NAS-158

*Project Duration (years)* 3 *Year of Project* 2

*Total Funds (current year)* $145,351.00

SUBMIT REPORT

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.