CITRUS ADVANCED TECHNOLOGY PROGRAM

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

SELECT PERIOD December 2013

(●) *Quarterly Report* ( ) *Final*

Proposal Title

Use of an early flowering gene in citrus to rapidly transfer disease resistance from citrus relatives into cultivated types

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
1/6/14	Citrus Research and Development Foundation	Transgenic/Metagenomic Mediation of Resistance

REPORT UPDATE (500 words-It is not necessary in this public report to disclose your institution's proprietary information or intellectual property.)

cDNA and genomic DNA sequences from the three FT citrus constructs were aligned with GeneBank's published Citrus Unshiu sequences to properly asses the identity of the constructs being used to transform tobacco and citrus. The evolutionary history was inferred using the Neighbor-Joining method with a total of 10 nucleotide sequences. The results display an optimal tree revealing that FT3 is the most different FT. Also, the analysis shows that ciFT1 and ciFT2 cluster together and display high sequence similarity, indicating that these genes might in fact be alleles and not two separate genes. The one year study of the in vivo tracking of FT1, FT2, and FT3 in various citrus trees differing in age and phenotype is currently being repeated with higher concentrations of cDNA to solidify data and four candidate genes in the flowering pathway (FLD, FLC, ELF5, and AP1) have been added to the study to determine their involvement in flowering time and what effect they might have in the induction of the three FT genes. Results and statistical analysis from the quantitative real time PCR for FT1 and FT2 are being analyzed to further prove the relationship between FT1 and FT2 as being allelic. Tobacco ciFT3 transgenic lines from T1 and T2 generations where studied in order to determine the segregation pattern for ciFT3. GUS histochemical testing was done on germinated seedlings from four lines of T1 plants and four lines of T2 plants. Results show a that the transgene is passed on to offspring in a stable manner and in accordance with expected segregation ratios given a single gene insertion assuming heterozygous parents or more than one genetic insertion of the transgene. One T2 line in particular appears to be homozygous for the GUS gene, indicating that all offspring should have the ciFT3 gene which induces early flowering. This segregation data will be included in the transgenic tobacco manuscript currently being written. The endogenous ciFT3 promoter was successfully cloned to be used in the transcription activator-like (TAL) effector system inducible by methoxyfenozide that will activate the naturally present FT3 gene in citrus.

PI First Name Gloria

PI Last Name Moore

Email gamoore@ufl.edu

Phone 352-273-4786

Organization University of Florida

Project Number 573

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

Total Funds (current year) $100,970.00

Form PR-12 Quarterly Reports **SUBMIT REPORT**

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.