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)

Expression of putative effectors of HLB in citrus

Proposal Title

Functional study of the putative effectors of 'Candidatus Liberibacter asiaticus' using Citrus tristeza virus vector

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
11/4/13	Citrus Research and Development Foundation	Pathogen/Disease Detection

REPORT UPDATE (500 words; summarize your accomplishments)

The following effectors of HLB were engineered into Citrus Tristeza Virus (CTV) vector have been in Citrus macrophylla and are being screened for their response to HLB pressure by Mike Irey.They include the following; CLIBASIA_05165, CLIBASIA_05605, CLIBASIA_01555, CLIBASIA_05195, CLIBASIA_05200, CLIBASIA_05620, CLIBASIA_05635, CLIBASIA_05665, CLIBASIA_05130, CLIBASIA_05155, CLIBASIA_05265, CLIBASIA_05560, CLIBASIA_05150, CLIBASIA_05180, CLIBASIA_05245, CLIBASIA_02250, CLIBASIA_03020, CLIBASIA_03025, CLIBASIA_02090 and CLIBASIA_02905. We are almost in the final stages of this project and interacting with Mike Irey at U S Sugar Corporation on the effect of HLB effectors on disecase mitigation in citrus.

A major useful outcome of this project is the finding that CTV-vector can be used as an Virus Induced Gene Silencing (VIGS) vector. This has been demonstrated to silence citrus endogenous Phytoene desaturase (PDS), and has also be used to potentially silence endogenous genes of psyllids (vecotr of HLB) in co-operation with scientists at CREC and USDA, Fort Pierce. We have positive feedbacks from these groups on the successful silencing of psyllid endogenous genes. This line of research potentially holds great promise in mitigating the spread of HLB by psyllid vector.
We presented an oral report based on this investigation in the 2013 International HLB conference in Orlnado.
Shubash Hajeri, Choaa El-Mohtar, William O. Dawson and Siddarame Gowda. Citrus tristeza virus-based RNA-interference (RNAi) vector and its potential in combating citrus Huanglongbing (HLB).

Additionally, CTV-RNAi vector, engineered with truncated abnormal wing disc (Awd) gene of D. citri, on upon replication in citrus generated RNA silencing triggers, which induced altered Awd expression when ingested by feeding D. citri nymphs. Decreased Awd in nymphs resulted in malformed wing phenotype in adults and increased adult mortality. This impaired the ability of D. citri to fly, would potentially limit the successful vectoring of CLas bacteria between citrus trees in the grove. CTV-RNAi vector would be relevant for fast-track screening of candidate sequences for RNAi-mediated pest control. A full report of this investigation has been formatted into publication and will be submitted shortly to Plant Biotechnology, entitled; RNA virus-based plant-mediated RNAi induces silencing in phloem-sap sucking insect.
Shubash Hajeri, Nabil Killiny, Choaa El-Mohtar, William O. Dawson and Siddarame Gowda. This line of research was conducted with the co-operation of Dr. Nabil Killiny, Vector Entamologist at CREC.

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Organization IFAS-CREC

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Total Funds (current year) $119,200.00

SUBMIT REPORT

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.