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)

Finding genes to control citrus greening

Proposal Title

Identify and deliver antibacterial peptides and/or proteins for the control of citrus greening (Huanglongbing or HLB)

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
1/11/12	Citrus Research and Development Foundation	Transgenic/Metagenomic Mediation of Resistance

REPORT UPDATE (500 words; summarize your accomplishments)

This is a project to find an interim control measure to allow the citrus industry to survive until resistant or tolerant trees are available. We are approaching this problem in three ways. First, we are attempting to find products that will control the greening bacterium in citrus trees. We have chosen initially to focus on antibacterial peptides because they represent one of the few choices available for this time frame. We also are testing some possible anti-psyllid genes. Second, we are developing virus vectors based on CTV to effectively express the antibacterial genes in trees in the field as an interim measure until transgenic trees are available. With effective antibacterial or anti-psyllid genes, this will allow protection of young trees for perhaps the first ten years with only pre-HLB control measures. Third, we are examining the possibility of using the CTV vector to express antibacterial peptides to treat trees in the field that are already infected with HLB. With effective anti-Las genes, the vector should be able to prevent further multiplication and spread of the bacterium in infected trees and allow them to recover.

We now are making good progress:

• We continue to screen potential genes for HLB control and are finding peptides that reduce disease symptoms and allow continued growth of infected trees. We have about 50 new peptides that are now being screened. We are eliminating peptides that do not work and continuing to make and screen new ones.

• We have greatly improved our efficiency of screening. We are using small plants in order to screen faster. However, we have to balance psyllid damage with inoculation of HLB. We now are 'pulse-inoculating' plants by incubating them about 2-3 weeks with psyllids between intervals of no psyllids in the greenhouse.

• We have greatly improved the CTV vector to produce probably 100x more peptide.

• We have modified the vector to allow addition of a second anti-HLB gene.

• We have obtained permission and established a field test to determine whether the CTV vector and antimicrobial peptides can protect trees under field conditions.

• We continue to supply infected and healthy psyllids to the research community.

• We are testing numerous genes against greening or the psyllid for other labs.

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Organization UF, IFAS, CREC

Contract Number 00088391

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

Total Funds (current year) $309,194.00

SUBMIT REPORT

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.