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)

optimized citrus grafting system to screen compounds

Proposal Title

A RAPID SCREENING PROGRESS FOR CHEMICAL CONTROL OF HUANGLONGBING

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
1/16/11	Citrus Research and Development Foundation	Pathogen/Disease Detection

REPORT UPDATE (500 words; summarize your accomplishments)

The overall objectives of this project were: 1) Development of rapid regeneration of HLB-affected periwinkle by optimizing growth conditions for the diseased cuttings; 2) Screening and evaluating anti-microbial molecules for suppression of Liberibacter in periwinkle. In the past three months, the research was mainly focused on optimizing a citrus grafting system for screening chemical compounds in HLB control.

1. Developing an optimized citrus grafting system for screening chemical compounds in HLB control

The HLB-affected scions from different phenotypic types (yellow shoot and Blotchy mottle) and different cultivars (lemon and grape fruit) were grafted onto the Las-free citrus rootstocks (sour orange and grapefruit). The results showed that more than 60% of HLB-affected lemon scions survived and 70% of the inoculated rootstocks were infected at 6 months after grafting with high Las bacterial titers of HLB-affected scions. If the Las bacterial titers in the grafted scions were low (less than 1000), all grafted scions survived and grew better, and less than 30% rootstocks were infected with low bacterial numbers. The results also showed that plant growth regulators (PGRs) increased the survival rates of the grafted scions, but had no effects on the infection rates.

2. Evaluation of chemical compounds against Las bacteria using the optimized grafting systems

HLB-affected lemon branches were sampled and soaked in the PS (penicillin and streptomycin), MDL (metronidazole), Kasumin and DBNPA (2, 2-dibromo-3-nitrilopropionamide) solutions overnight, cut into 3 buds for scions (S1, S2 and S3) and then grafted onto the Las-free grapefruit (R). More than 80% of the scions treated with PS survived and grew better than the untreated controls, and no rootstocks and scions tested positive by qPCR for Las bacteria. When the HLB-affected scions were treated with MDL, more than 60% of the scions survived, but more than 95% rootstocks and grown scions were infected by Las bacteria. DBNPA-treatment partly inhibited the Las bacteria with 40% of infection rates in the grafted scions and rootstocks. Only 4.4% HLB-affected scions survived when treated with kasumin at 1mg/ml, showing the phytotoxic effects.

3. Continue to monitor the effect of antibiotics on HLB-affected citrus trees in the field

In June of 2010, the screened antibiotic combinations (PS and KO) have been applied to the HLB-affected citrus in the field by trunk-injection. The primarily results showed that the antibiotic combinations decreased the Las bacteria titer in the treated citrus as compared to controls. In the past three months, the trunk injection of antibiotic combination was continued in Oct and Dec. The Las bacterial number was quantified by qPCR.

Two abstracts were submitted in 2nd International HLB meeting, one manuscript has been accepted in phyopathology.

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Organization IRREC-IFAS-UF

Contract Number 161

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

Total Funds (current year) $75,000.00

SUBMIT REPORT

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.