Florida Citrus Advanced Technology Program

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

Instructions Complete the fields based on your project specs. When finished, save the form to your local disk using a unique name. Then, go to **http://research.fcprac.com**, and log in with your user name and password using Researcher Login in the lower left. Find this project title and click on **Submit a Report**. Update your profile information if needed, then upload this report as directed.

2009-2010 REPORT	CATEGORY (drop-down)	TODAY'S DATE (m/d/yr)
(●) *Quarterly Report* ( ) *Annual Report* ( ) *Final*	Management	1/12/10

WHAT IS THE "HEADLINE" FOR THIS REPORT (e.g. a one-sentence "newspaper headline" describing what you accomplished)

Chemical Control of HLB

TITLE and CONTACT INFORMATION

Proposal Title A Rapid Screening Process for Chemical Control of Huanglongbing

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Organization University of Florida	*Total Direct Funds (current year)* $60,000

REPORT UPDATE (650 words; provide details about your headline)

QUARTERLY RESEARCH REPORT
(Jan. 08, 2010)

In the past 3 months (from Oct. 2009 to Dec. 2009), the research was focused on the on-going evaluation of the new candidate compounds for HLB control using the optimized regeneration system in periwinkle, the effectiveness of the compounds that killed Liberacter in periwinkle to control HLB in citrus and the effects of PS on microorganism diversity in rhizosphere soil.

RESULTS

1. On-going evaluation of the new compounds

MDL, OPP and SA were selected and evaluated against the Las bacteria and for their phytotoxiticy using the optimized regeneration system in periwinkle. MDL is an antibiotic drug used against anaerobic bacteria. The results showed MDL is effective in eliminating Las bacteria in the Las-infected periwinkle cuttings. The Las can't be detected in the treated, regenerated plants. MDL is currently being tested in the citrus grove at the Pico Farm, USDA. OPP and SA were not effective. High concentrations of OPP and SA inhibited regeneration rates in Las-infected periwinkle. The regenerated plants from OPP- or SA-treated cuttings kept high titers of Las bacteria. The average Ct value in the regenerated plants was less than 30.

2. Effects of the screened compounds on HLB-affected citrus

HLB-affected container-grown citrus was treated with PS, one of the screened effective compounds against Las bacteria. The HLB-affected citrus seedlings were soaked in PS three times. Citrus samples were taken once each month for Liberibacter analysis. The Las bacteria could not be detected in the container-grown citrus two months post treatment, by Q-PCR. The PS-treated citrus grew better than citrus receiving control treatments. When PS combined with other PGRs was injected into HLB-affected, container-grown citrus, PS can also eliminate the Las bacteria in the greenhouse. Thus, PS can control Las in container-grown citrus when applied either as a root drench or by injection. In August 2009, PS at three different rates (2.5g. 5g and 10g per tree) was injected into HLB-affected field citrus trees with 10~15 cm in diameters. Leaf samples were randomly taken and tested in Oct and Dec, 2009. The average Ct value in the PS-treated citrus grove increased from 26 in the pre-treatment to 32 in the post-treatment. All treatment rates were effective. Some other compounds, such as MDL and KESU are also being evaluated in the field.

3. Effect of PS on microorganism diversity in rhizosphere soil

Rhizosphere soil samples were taken from the PS-treated citrus pot. Soil DNA was extracted using a Soil DNA Extraction Kit (Mio-Bio). Diversity of microorganisms in the soil was evaluated by RFLP. The results showed that treatment of field citrus with PS had no effect on the diversity of soil microorganisms. The residues of PS in the citrus fruit will be tested later.

CONCLUSIONS

1. PS was effective against Las bacteria in periwinkle or in citrus.
2. MDL is also effective compound against Las, but MDL is not easily dissolved in water. Improving the water solubility of MDL and would be was necessary for MDL application in HLB control.
3. OPP or SA was not effective in control of Las bacteria.