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*	Genetics	9/30/09

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

HLB Resistance Identified in USDA Hybrids

TITLE and CONTACT INFORMATION

Proposal Title Development of Promising New Rootstocks and Scions for Florida Citrus

Principal Investigator Kim D. Bowman	*PI Last Name* Bowman
Email kim.bowman@ars.usda.gov	*FDACS Contract Number* 13502
Phone 772-462-5920	*Project Duration (years)* 12 *Year of Project* 6
Organization USDA, ARS	*Total Direct Funds (current year)* $200,953.00

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

In this quarter, three new field trials were planted at the Whitmore Farm in Lake County to study inheritance of fruit quality factors in sweet orange-type material from populations of hybrids between high quality pummelo and mandarin parents. One of these was planted on trellis, to also examine the effect of tree manipulations on the length of time for transition from juvenility to maturity. Tree performance information was collected from existing USDA rootstock field trials. Greenhouse trees were inoculated for assessment of new Supersour rootstock hybrids for tolerance to CTV. Cuttings were made from new Supersour rootstock hybrids to propagate trees for field trials. Seedling and cutting liners of rootstock selections in the greenhouse were budded with Valencia, Hamlin, Ray Ruby, and Minneola to prepare trees for field trials. Studies continue to assess rootstock and scion tolerance of Huanglongbing (HLB) under field conditions and in the greenhouse. Some rootstocks and scions appear more tolerant to HLB infection than others. Some new hybrids that were studied remain healthy and vigorous despite HLB infection and have been selected for further field and greenhouse testing. US-897 rootstock has exhibited strong tolerance to HLB infection and preliminary information suggests it confers increased HLB tolerance on trees with susceptible scions. Experiments were conducted to assess the effectiveness of different methods for testing new cultivars for resistance to Asian citrus psyllid and HLB disease. A field experiment continued to identify rootstocks with resistance to the Phytophthora-Diaprepes Complex. In coordinated research between this grant and the FCATP transgenic citrus grant to USDA, selected anti-microbial and insect resistance genes were inserted into outstanding rootstock and scion cultivars to develop new cultivars with resistance to HLB and Citrus Bacterial Canker (CBC). Selected transgenic rootstocks from this effort were challenged with HLB and CBC to assess resistance potential. Some transgenics were found to have potential resistance or tolerance. Research is continuing to follow leads generated by the HLB gene expression study completed last year, including cloning of a selected promoter strongly expressed in response to HLB infection, and combining that promoter with selected resistance genes to produce transgenic citrus with a rapid resistance response. An early flowering gene, FT, was transformed into superior citrus breeding material to facilitate rapid introgression of favorable traits, such as disease resistance, into new cultivars and increase early productivity of scion cultivars. Four new hybrid rootstocks, US-1235, US-1239, US-1225, and US-1241, were identified as especially promising for expanded field trials in the coming year.