CITRUS ADVANCED TECHNOLOGY PROGRAM

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

SELECT PERIOD September 2013

(●) *Quarterly Report* ( ) *Final*

Proposal Title

Investigate effect of nutritional sprays on healthy and HLB-diseased orange fruit and resulting juice quality

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
10/24/13	Citrus Research and Development Foundation	Infection Consequences

REPORT UPDATE (500 words-It is not necessary in this public report to disclose your institution's proprietary information or intellectual property.)

Activities for this quarter included sensory panel and chemical analyses of fruit harvested from Huanglongbing (HLB) or greening-infected trees in winter (December Hamlin), 2012 (actually prior to start of project), winter (January, Hamlin) and 2013 spring (April and June, Valencia) herin referred to as "season 1" (2012-2013) of the two seasons scheduled in the grant (2012-2013, 2013-2014). For season 1, trained sensory panels were completed and analyzed for all harvests and both varieties, while difference-from-control tests are still ongoing. Chemical analyses of sugars, acids, aroma volatiles, vitamin C, limonoids and flavonoids are completed, but the data not yet completely analyzed except for sugars, acids and vitamin C for the two Hamlin harvests. The molecular (qPCR) analysis of the titer of the pathogen (Liberibacter asiaticus) DNA in the juice has been completed and analyzed for all Hamlin and Valencia harvests of season 1.

For season 1 to answer the question whether the nutritional spray programs reverse the color, size, shape and sensory flavor defects of HLB disease, the nutritional programs studied so far have shown no effect on color, size, shape or flavor, although one of the treatments may make the fruit taste somewhat sweeter.

For season 1, to determine if the nutritional spray programs reverse the chemical composition of orange juice normally caused by HLB compared to conventional spray programs and juice from healthy trees, sugars, acids and vitamin C were all lower in all HLB treatments, regardless of nutritional treatments, resulting in similar solids/acid ratios for all treatments (Hamlin harvests). Not all the season 1 harvests' data have been analyzed for limonoids and flavonoids, but so far the bitter limonoids and other flavonoids are higher in HLB-infected juice, regardless of nutritional treatment, and especially in symptomatic fruit or fruit from severely infected trees. Therefore, so far the nutritional treatments have not reduced the chemical off-flavor components or increased desirable flavor components like sugars to any significant degree.

To determine any relationship between nutritional foliar spray programs and pathogen (Liberibacter asiaticus) titer in the juice using real time qPCR, compared to conventional spray programs, the nutritional spray programs did not reduced the pathogen titer in the . Therefore the nutritional treatments did not lower the bacterial pathogen titer in the juice for either variety for season 1.

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Organization USDA-ARS Horticultural Res Lab

Project Number 702

Project Duration (years) 2 *Year of Project* 1

Total Funds (current year) $26,993.00

Form PR-12 Quarterly Reports **SUBMIT REPORT**

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.