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*	Other	10/2/09

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

Chemical and sensory analyses of second Valencia harvest, use of e-tongue and nose to discriminate HLB juice

TITLE and CONTACT INFORMATION

Proposal Title Effects of HLB on quality of orange juice and identification of HLB-induced chemical signature in fruit juice and leaves

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Phone	*Project Duration (years)* *Year of Project*
Organization USDA-ARS Citrus & Subtropical Prod Lab	*Total Direct Funds (current year)* $147,567

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

In the last quarterly report, two harvests of fruit from 15 trees of Hamlin in February and Valencia in April were analyzed for chemical and sensory traits. Now we add information on a June Valencia harvest from 15 trees. For these samples, the Brix ranged from 10.6 to 12.2, acid from 0.50% to 0.58 %, ratio from 20.8 to 21.2 and oil from 0.014% to 0.028 % (highest for symptomatic fruit). For the February Hamlin samples, there were no major differences in Brix, acid, ratio and oil content, but for Valencia fruit from the first harvest (April), the juice from symptomatic HLB fruit was high in acid and oil content compared to the controls, and the asymptomatic HLB fruit juice was in between symptomatic and control values. For the second (June) Valencia harvest, the main difference was that the oil content was higher in asymptomatic and symptomatic fruit juice, possibly due the action of the extractor on fruit of smaller size. Juice samples from all harvests were frozen for other chemical analyses (individual sugars and acids, vitamin C, limonin, nomilin and other secondary metabolites as well as aroma volatiles) for later analysis by HPLC and GC, and samples for gas chromatography-olfactometry (GC-O) work were prepared for Russ Rouseff at the CREC. Individual sugar, acid and total ascorbic acid analyses are now done on all three harvests (1 Hamlin and 2 Valencia). Hamlin and the April Valencia samples were higher in citric and lower in malic acids for both asymptomatic and symptomatic HLB fruit juice compared to healthy, while there were no differences for the June Valencia samples. Hamlin and the April Valencia harvest were often lower in fructose and/or glucose for asymptomatic and sucrose as well for symptomatic HLB juice samples, but again, there were no differences for the June Valencia samples.

For the descriptive sensory data, there were differences in Hamlin juice and in the juice of the April Valencia harvest for many descriptors (reported for last quarter), however for the June Valencia harvest, there were no differences in aroma (smell) descriptors , and this time control juice was lower in orange and fresh flavor compared to asymptomatic HLB juice, and higher in the paint descriptor (unlike the previous Hamlin and April Valencia harvests). Symptomatic HLB juice was higher in sour/fermented, peppery/musty and salty/umami descriptors than asymptomatic HLB juice, but not different from control juice. For flavor (taste and smell) of the June Valencia samples, HLB juice from asymptomatic fruit was not significantly different in flavor from control juice in the difference from control tests, and even a trained panel could find little difference between these two types of juices (reflecting the lack of differences in the chemical analyses). The electronic tongue and nose were tested to see if these instruments could discriminate between healthy, asymptomatic and symptomatic HLB juice samples collected in 2008 and 2009. The e-tongue sensors could clearly differentiate between juice from HLB symptomatic fruit, and juice from healthy trees. Juice from asymptomatic HLB fruit was classified between these two samples in 2008 and undifferentiated from the healthy samples in 2009, reflecting the sensory data for those years. The electronic nose could also separate juice from symptomatic fruit in 2008. The use of electronic nose or tongue would be of interest to industry to screeni juice for HLB-induced off-flavors. A postdoc is currently conducting threshold tests for the worst tasting symptomatic juice in normal juice and determining off-flavored compounds for individual thresholds in normal juice.