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	7/8/09

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

Sensory results

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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Organization USDA-ARS Citrus & Subtropical Prod Lab	*Total Direct Funds (current year)* $147,567

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

This is the first quarterly report on the Hamlin and Valencia harvests in January and April, 2009, respectively. Difference-from-control tests were run for "healthy" juice from fruit harvested from control non-HLB symptomatic trees versus "HLB" juice from non-symptomatic (HLB-NS) fruit harvested from HLB-symptomatic trees within the same grove (15 trees/disease state/variety combination). We also ran the above juice plus juice from symptomatic fruit (small, green, lopsided) harvested from HLB-symptomatic trees (HLB-S) through a trained citrus panel. Fruit were juiced using a JBT 391 extractor and pasteurized under simulated commercial conditions (Microthermics HTST Model 25, 90 ºC/10 s). For the Hamlin samples, the Brix ranged from 10.33 to 11.16, acid from 0.54 to 0.58 %, ratio from 19.1 to 21.1 and oil from 0.014 to 0.019 %. For the Valencia samples, the Brix ranged from 11.92 to 12.5 , acid from 0.65 to 1.18 % (HLB-S juice), ratio from 10.1 to 18.6 and oil from 0.02 to 0.037 % (HLB-S juice). So for the Hamlin harvest, there were no big differences in Brix, acid, ratio or oil content, but for the Valencia fruit, the juice from HLB-S fruit was high in acid and oil content compared to the healthy controls and the HLB-NS fruit, which were similar. Juice samples were frozen for other chemical analyses (individual sugars and acids, vitamin C, limonin, nomilin and other secondary metabolites as well as aroma volatiles) to be done in the off-season, and samples for gas chromatography-olfactometry (GC-O) work were sent to Dr. Russell Rouseff along with the transfer of $20,000 to the University of Florida for this analysis. Another batch of Valencia fruit were harvested June 25th, juiced, pasteurized and frozen, but not yet analyzed by sensory panels. For these fruit the Brix ranged from 10.65 to 12.23, acid from 0.50 to 0.58 %, ratio from 20.8 to 21.2 and oil from 0.014 to 0.028 % (HLB-S fruit). So for this harvest, the main difference was that the oil content was higher in HLB-S fruit juice, possibly due the action of the extractor on fruit of smaller size. We hope to obtain a final Hamlin sample in the fall. In addition, leaves were harvested for study from Hamlin trees (frozen for analysis), and a postdoc has been selected and is due to come on board in August, 2009 for threshold work to determine the effect of symptomatic HLB juice on flavor on normal juice.

Sensory results showed that there were no differences between juices made with fruit from control or HLB-NS by the difference-from-control test for either Hamlin, harvested in January or Valencia, harvested in April. This means that the average consumer would not likely find a flavor difference between these two groups of juices for either of these varieties, much less detect a difference if this juice was blended with normal juice. Differences were found, however by the trained panel, but mostly for HLB-S fruit (small, green, lopsided, etc.) compared to healthy controls and only a few descriptors were different for HLB-NS fruit compared to controls. There were differences in Hamlin juice for orange and paint aromas as well as orange, fruity-non-citrus, fresh, sour/fermented, peppery/musty, paint, sweet, sour, salty/umami, bitter and metallic flavor descriptors between healthy controls and HLB-S juice, with the exception of the fruity-non citrus descriptor, which showed that both HLB-S and HLB-NS fruit juice to be lower in intensity compared to control juice. For the rest of the descriptors, HLB-S fruit were significantly lower in intensity for orange aroma and orange, fresh and sweet tastes; and higher in sour/fermented and paint aromas and sour/fermented, peppery/musty, paint, sour, salty/umami, bitter, metallic and tingling flavors/sensations. Results for Valencia were similar to Hamlin except that the peppery/musty and peel oil flavor showed differences (higher in HLB-NS and HLB-S juice for peppery aroma and HLB-S juice for peel oil flavor).