

3.13 Comparison of a starch-based field test for Huanglongbing to results from real-time PCR testing of field samples from symptomatic trees in Florida.

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One of the difficulties of diagnosing Huanglongbing (HLB) in the field is the variety of symptoms that infected trees may present. In addition to the variation in symptom type, field observations in Florida indicate that not all symptoms are present on all trees, that there may be some periodicity to the types of symptoms that are present throughout the year, and that there is tree to tree and grove to grove variation at any given time. In addition, many of the symptoms of HLB are similar to symptoms of other problems commonly found in Florida citrus orchards. HLB symptoms can resemble nutrient deficiencies, Phytophthora-induced symptoms, herbicide injury, mechanical damage, etc., and thus laboratory testing is often needed to verify the presence of HLB in the grove. Currently, laboratory testing is based on one of many different polymerase chain reaction-based testing methods (PCR) that have been reported in the literature. Although sensitive, specific, and accurate, PCR-based testing is tedious and expensive thus limiting the number of samples that can be tested. A starch-based field test has been reported to be useful as a field test for HLB but little data regarding temporal, varietal, and spatial variability are available thus far as to the correlation of the starch-based test results to PCR-based testing.

During 2007 and early 2008, leaf samples were collected from 1759 HLB suspect trees. For each tree, the predominant symptom type on the tree was noted and leaf samples were tested using the starch test and real time PCR (RT-PCR). Over all samples collected from the symptomatic trees, 85% of the samples were positive by RT-PCR versus 78% positive for the starch test. The starch and the RT-PCR test results agreed for 76% of the samples. There did not appear to be substantial differences in the correlation between the tests during the months of July and February, but there was a difference in the correlation between the two tests in June. No difference between early-midseason and Valencia varieties with respect to the correlation between the two types of tests was found, but there was a difference between the various symptom types. The best correlation between the tests was obtained for leaves exhibiting the classic blotchy mottle leaf symptom and the worst correlation was obtained with leaves showing the green island symptom type. Overall, the RT-PCR testing was more consistent in detecting HLB infected trees than the starch test. Therefore, the starch test should be considered a useful tool for HLB diagnosis in the field, but not as a substitute for PCR-based testing.