—Scientific Note—

Candidatus Liberibacter asiaticus Movement and Carbohydrate Allocation in Different Citrus Scion–Rootstock Combinations during the First Year After Infection

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Huanglongbing (HLB) is associated with a phloem-limited bacterium, Candidatus Liberibacter asiaticus (CLas), vectored by the Asian citrus psyllid. Studies have shown that HLB causes starch accumulation in aboveground tissues in citrus plants while causing starch depletion in the roots (Etxeberria et al., 2009); however, changes in starch distribution following natural infection in the field have not been documented. The objectives of this study were: 1) to determine CLas distribution in leaves and roots of newly planted citrus trees after natural inoculation in the field; and 2) to determine rootstock effects on CLas and starch allocation in graft combinations with sweet orange during the first year after infection.

Seven commercially important rootstock cultivars were grafted with ‘Valencia’ orange (Citrus sinensis) scion and planted in a southwest Florida citrus orchard in Mar. 2019, where HLB is endemic. Previous studies (Folimonova et al., 2009; Albrecht and Bowman, 2012; Boava et al., 2015) have documented that trifoliate orange and some hybrids are more HLB-tolerant than cultivars without trifoliate orange in their parentage. The rootstock cultivars used were ‘US-802’, ‘US-897’, ‘US-942’, ‘Carrizo’, and ‘Swingle’, which are hybrids of citrus and trifoliate orange (Poncirus trifoliata), sour orange (C. aurantium), and ‘Cleopatra’ mandarin (C. reticulata).

The experimental design was a randomized complete-block design with 10 replications. Trees were planted in March 2019 at the Southwest Florida Research and Education Center in Immokalee, Florida. Leaves and fibrous roots were collected in Fall and Winter 2019 and in Spring and Summer 2020 to measure starch concentrations and CLas titers.

Three months after planting (Summer 2019), 35% and 62% of trees were CLas-infected based on leaf and root analysis, respectively, whereas 94% and 61%, respectively, were infected by Summer 2020 (15 months after planting) (Fig. 1). Starch concentrations in the leaves were significantly higher than in the roots throughout all seasons and, like the CLas titers, increased from Spring 2020 to Summer 2020 (Fig. 2). Root starch concentrations and CLas titers were lowest in spring 2020 and increased in Summer 2020. There was a significant rootstock effect for root starch concentrations in Fall and Winter 2019, but this effect was
not consistent and not related to HLB tolerance. There was also no clear indication that starch depletion followed by root decline is one of the early consequences of CLas infection.

**Literature Cited**


