# Should Trees Melow-Tone-In for Citrus Greening?

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Citrus Huanglongbing (HLB), commonly known as citrus greening, is the most devastating disease in the world and has devastated Florida citrus industry. HLB is caused by the phloem-colonizing bacterial pathogen Candidatus Liberibacter asiaticus (CLas). There are no efficient HLB control approaches. CLas causes systemic and chronic immune responses to the production of reactive oxygen species (ROS), which kill phloem cells and cause HLB symptoms. Antioxidants have been used to treat immune-mediated human diseases. My hypothesis is that treatment of HLB diseased trees with melatonin (an antioxidant) mitigates ROS damage and improves citrus tree health. To test this hypothesis, I conducted foliar spray of HLB diseased citrus trees with melatonin (300 μM) weekly for 4 weeks. Water was used as the negative control. Four trees were used for each treatment with one tree as one biological replicate. Quantitative PCR (qPCR) was used to measure the CLas bacterial concentrations in leaf samples at 1, 7, and 28 days after the first application. H2O2, an indicator of ROS, was measured at the same time points. At all three time points, there were no significant differences between the melatonin treatment and water control for both CLas bacterial concentrations and H2O2 concentrations. However, the H2O2 concentrations in the melatonin treatment were lower than the water treatment at both day 7 and day 28. The melatonin treated trees showed slight improvement in reducing HLB symptoms compared to the water control. The data suggest that treatment of HLB diseased citrus trees with an antioxidant melatonin has positive effect in reducing the oxidative stress as measured by the ROS levels, but had no effect on CLas growth in plants, thus supporting my hypothesis.

**Awards Won:**