

## Current Research Objectives

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**Research topic:** Root Pathology

**Primary Research Objective(s):** Understanding the effects of HLB on citrus roots and interactions with soilborne pathogens. Understanding the role of root infection on treatments for HLB.

**Research Goal:** Improve root health on HLB-affected citrus trees

**Outcomes to date:** We learned that HLB severely damages citrus roots while simultaneously stimulating root growth. This indicates that root longevity is severely impaired. We have identified a rootstock that does not suffer HLB-associated root loss, which is a model system for finding the mechanism of root loss and breeding source for HLB tolerance in roots. We have determined that HLB increases susceptibility of roots to other root diseases and pests such as Phytophthora root rot, while reducing efficacy of oomycete fungicides.

We have provided evidence and recommendations to growers that root growth stimulation will be counterproductive in managing root health and HLB and that minimizing root stress to improve root longevity is the most likely path to successful root health management with HLB. Growers implemented soil acidification to reduce stress on root systems and improve root densities, tree health, and yields. Growers have modified their rootstock selection practices for new plantings based on information about soil stresses on root health in HLB-affected rootstocks and interactions between HLB and soil-borne pathogens. Growers have adopted fertigation and altered irrigation practices to improve water and nutrient uptake in trees with reduced root systems, improving tree health.

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