

Current Research Objectives

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Research topic: Effect of Selected Concentrations of Calcium Bicarbonate on Expression of HLB in greenhouse and grove.

Primary Research Objective(s): Better understanding of the impact of bicarbonates on the health and productivity of HLB infected trees and improved recommendations for treating alkaline irrigation water

Research Goal: Verification of bicarbonates as a cause of additional stress on HLB infected citrus trees causing further decline in vigor and productivity.

Outcomes to date: Moderation of elevated soil pH improves nutrient uptake and improves water relations with potential for improved biomass accumulations and yield.

Greenhouse Results:

- Average water uptake by HLB affected trees were 20%-25% lower than healthy trees in the greenhouse lysimeters during 2016 and 2017.
- Tree root densities were significantly lower for healthy trees irrigated with water supplemented with calcium carbonate (approx.. 3 cm) when compared with healthy trees irrigated without supplemental calcium carbonate (approx.. 10 cm)
- Water uptake by trees receiving water supplemented with calcium bicarbonate was significantly reduced (10-15%) compared with health trees but substantially greater reduction for HLB affected trees (>20%).
- Tree heights were similar for HLB affected and healthy trees irrigated with calcium carbonate but significantly smaller than healthy trees not receiving modified irrigation water.

Field Results:

- Irrigation water and soil acidification treatments resulted in a gradual lowering of soil pH from above 7 to 5 for all treated plots.
- Leaf Ca, Mg, Mn, Zn and B concentrations in leaves were greater at both sites with reduced water and/or soil pH than non-treated controls at both the young tree and mature tree groves
- Root density samples taken in February to June indicate a significantly greater root length density with lower soil pH.
- Tree canopy volume and yield tended to be larger with lower soil pH, however, no significant differences were found among treatments at either study site.

Funding source for this objective(s): CRDF