

Effect of Nitrogen, Calcium, Magnesium, Manganese and Zinc on Leaf Nutrient Status, Growth, and Yield of Mature HLB-affected Citrus Trees

Researchers: Kelly T. Morgan

Contact: Kelly T. Morgan

conserv@ufl.edu

UF/IFAS SWFREC



The reaction of foliar and ground-applied essential nutrients is the least studied of HLB-associated topics targeting HLB-affected citrus on sandy soils. We conducted three Nitrogen rate (N) studies where N was ground-applied in 20 splits biweekly (February to November). Two projects were conducted where 1) micronutrients- Manganese (Mn), Zinc (Zn), and Boron (B) were foliar and/or ground-applied in three splits following the spring, summer, and late summer flush seasons and 2) secondary macronutrients

Calcium (Ca) and Magnesium (Mg) applied separately and in combination at the same timing of the micronutrients. Results of the Nitrogen Rates Study: significantly higher soil N concentrations were detected in the topsoil depth (0-6 inches) than the two lower soil depths indicating lesser nutrient leaching as trees receiving the moderate (200 pounds per acre) N rate. Leaf N concentration remained above the optimum nutrient range implying a lower N rate of 180 pounds per acre. Micronutrient Rate Study: Root

Mn and Zn concentrations were significantly higher in the root tissues. Split ground application of 200 pounds per acre of N, along with foliar-applied coupled with ground-applied Mn and Zn are suggested to sustain the essential leaf nutrient concentration with the optimum range and improve vegetative growth and yield. Secondary Macronutrient Study: The 200 pound per acre N rate coupled with a full Ca or Mg dose significantly increased canopy volume, leaf nutrient concentration, and fruit yield.

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