

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

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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 as 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 as approximately three times the current UF/IFAS recommendation of 5 lbs metallic per acre per year 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. These results on Mg, Ca, Mn, and Zn rates will be evaluated for recommendation changes in 2022.

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