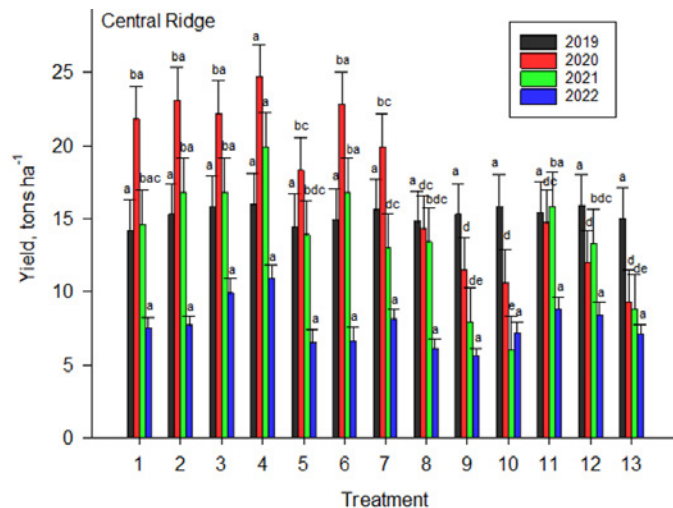


Development of Root Nutrient and Fertilization Guidelines for HLB-affected Orange and Grapefruit Trees

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Summary: Huanglongbing (HLB)-affected citrus trees have a fibrous root loss of about 30 to 80%, which increases as HLB symptoms develop in the canopy. Investigating optimal nutrient concentrations in citrus roots thus improves our understanding of HLB dynamics concerning root nutrition and fertilizer application methods. This study sought to evaluate nutrient uptake of HLB-affected orange trees via soil fertilizer applications for 5- to 6- year-old ‘Valencia’ orange trees on Swingle rootstock at Ridge and Flatwoods sites. Macronutrients and micronutrients were applied at varying fertilization rates of standard fertilization via fertigation according to UF/IFAS guidelines. For macronutrients, the rates were a) standard fertilization + 40 lbs/acre

Ca + 40 lbs/acre Mg + 220 lbs/acre K and b) standard fertilization + 90 lbs/acre Ca + 90 lbs/acre Mg + 440 lbs/acre K. For micronutrients, the rates were a) standard fertilization + 5 lbs/acre Fe, 5 lbs/acre Mn, 5 lbs/acre Zn + 1 lb/acre B, b) standard fertilization + 10 lbs/acre Fe, 10 lbs/acre Mn, 10 lbs/acre Zn + 2 lbs/acre B and c) standard fertilization + 20 lbs/acre Fe, 20 lbs/acre Mn + 20 lbs/acre Zn + 4 lbs/acre B. Soil and leaf samples were collected for nutrient concentration analysis in spring and fall 2019 and summer 2020. No significant differences among treatments were observed for tissue and soil nutrient concentrations due to nutrient interactions. Fruit yield between 2019, 2020, 2021, and 2022 harvest seasons increased with increased nutrient availability. Therefore, at higher fertilization

rates of (standard fertilization + 40 lbs/acre Ca + 40 lbs/acre Mg + 220 lbs/acre K + 20 lbs/acre Fe, 20 lbs/acre Mn + 20 lbs/acre Zn + 4 lbs/acre B), HLB-affected trees showed increased nutrient uptake, and root development improving overall tree performance.

Take Home Message:

- Fruit yields and juice quality were elevated with improved macronutrient and elevated micronutrients.
- Root development (longevity, length, volume, and area) was greater with elevated soil-applied micros at all rates of macronutrients.
- Canopy size was comparable between treatments at both ridge and flatwoods sites.

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