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Irrigation management effect on water dynamics of citrus huanglongbing trees and soil

Due to production declining and negative economic effects, there is an urgent need for strategies that reduce the impact of Huanglongbing (HLB) on citrus (Citrus x sinensis (L.) Osbeck). The objective of this study was to evaluate the impact of different irrigation schedules on soil volumetric water content (θv) and water uptake characteristics of citrus trees affected by HLB in central and southwest Florida. The study was conducted during two years on five-year-old sweet orange (Citrus x sinensis (L.) Osbeck) trees located in three commercial groves at Arcadia, Avon Park, and Immokalee, Florida. Three irrigation treatments included University of Florida, Institute of Food and Agricultural Sciences (UF/IFAS) recommendations, daily irrigation, and a schedule intermediate to the selected treatments and provided similar volumes of water per week based on ETo. Sap flow (SF), leaf area, leaf area index, and stem water potential (Ψ) were determined at selected intervals. Also, θv was measured using capacitance soil moisture sensors at incremental soil depths of 0-15, 15-30, and 30-45 cm. Significant differences (α =0.05) were found in average SF, leaf area index, Ψ , and θv measurements among treatments. Diurnal SF value under daily irrigation treatment increased by 91%, 51%, and 105% and θv under daily treatment increased by 39%, 13%, and 57% compared to UF/IFAS irrigation treatment in Arcadia, Avon Park and Immokalee, respectively. Results indicate that, daily irrigation improves trees water dynamics and greater mean soil water content than UF/IFAS or intermediate treatments and reduce trees stress with the same volume of irrigation water.

Biography

Kelly T Morgan is a Professor of Crop Irrigation and Nutrient Management at the University of Florida. He has received his graduate degrees from the University of Florida in Soil and Water Science and Agricultural Engineering Departments. He has worked in University of Florida for 26 years specializing in improving water and nutrient use efficiency in the sandy soils of central and south Florida. His studies to assess nutrient application rates and irrigation management to increase nutrient use efficiency and minimize nutrient loss to the environment. He has published over 75 peer reviewed journal papers, 10 book chapters, and nearly 200 other publications.

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