IMPLEMENTING FULL AND DEFICIT IRRIGATION PRACTICES USING SOIL MOISTURE AND SAPFLOW SENSORS FOR WATER SAVINGS IN CITRUS PRODUCTION SYSTEMS

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Citrus production in Florida has declined as a result of the devastating impact of citrus greening. Use of modified irrigation practices and soil moisture sensors appear to improve tree health, water use and water storage. We have been conducting studies for the past 3 years where we compared the full irrigation (100% evapotranspiration, ET) and deficit irrigation (75-80% ET) practices under greenhouse and field conditions. In the field, we used reflective mulch to compare water savings and evaporation losses with bare ground. Soil moisture sensors (EC-5 and 10-HS) were used to monitor water availability and water volumes were estimated with water meters. Additional measurements included stem water potential, canopy size, soil moisture and sap flow water use. Results of soil moisture, stem water potential and sapflow data show comparable tree response of deficit irrigation treatments to full irrigation rates. In addition, tree growth and size appear to be greater with reflective mulch compared to bare ground under field conditions. Use of deficit irrigation practices would result in 20 to 25% water savings without compromising tree performance on Florida sandy soils. These studies have been conducted on Florida central ridge soils, southwest flatwoods and southeast flatwoods and will provide useful data for developing novel guidelines for optimizing citrus water management.

PRESENTER BIO: Dr. Kadyampakeni is an Assistant Professor of Soil and Water Sciences and the UF Water Institute Early Career Fellow between 2019-2022. He has a research and extension appointment focusing on irrigation and nutrient management and soil/crop modeling of citrus and other horticultural crop production systems.