Estimation of Water Uptake using the Stem-Heat Balance Technique for 2- and 4-year old Citrus

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Citrus production in Florida accounts for 63 % of national production. Citrus yield in Florida is influenced by water management practices due to the low water holding capacity of the sandy soils (>94% sand) and the uneven rainfall distribution pattern across the Florida citrus producing regions. Thus, an accurate estimation of water uptake is key to scheduling irrigation, enhancing water and nutrient uptake and use-efficiency. Three treatments are being studied: 1) Drip open hydroponic system, irrigated daily in small pulses and fertigated daily; 2) Microsprinkler open hydroponic system, irrigated daily and fertigated weekly; 3) Conventional microsprinkler practice, irrigated weekly and fertigated monthly at the one site and fertilized quarterly at a second site. Three to four trees per treatment were used to determine differential water uptake in July 2010 at the ridge site and June 2011 at the flatwoods site, respectively. Results indicate increased sapflow across all treatments and higher water uptake in treatments having higher irrigation frequency than conventional grower practice. These results suggest the possibility of increasing both water and nutrient uptake using the intensive, open hydroponics compared-to the traditional irrigation and fertilizer application methods.

Key words: Citrus, Evapotranspiration, Fertigation, Hydroponics