ASSESSING CITRUS WATER USE WITH LYSIMETRY USING EVAPOTRANSPIRATION-BASED IRRIGATION IN FLORIDA

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Irrigation in Florida citrus production is important for better growth and development of trees affected by citrus greening (or huanglongbing aka HLB). A greenhouse study was conducted from October 2019 to July 2021 at the Citrus Research and Education Center in Lake Alfred, FL to assess water use dynamics in 2- to 4-year-old HLB-affected 'Valencia' orange (*Citrus sinensis*) trees on 'Kuharske citrange' rootstock (*Citrus sinensis x Poncirus trifoliata*). This study is important because citrus growers could reduce irrigation water use thereby cutting irrigation expenses. Four treatments consisting of 100% evapotranspiration (ET) or full irrigation and 80% ET (or deficit irrigation), on HLB- and non HLB-affected (NHLB) trees were used with 5 replications for each treatment. All pots were mulched to minimize surface water evaporation. We measured water use, stem water potential, root length and diameter, and compared all parameters among treatments. Stem water potential data showed no significant water stress among HLB-affected trees with full irrigation (100% ET) and or the deficit irrigation treatment (80% ET). Root growth was higher in non HLB trees than HLB-affected trees. However, considering root length and diameter, there was no significant difference between full- and deficit-irrigated HLB-affected trees. In Spring 2021, HLB-affected trees that received 100% ET showed higher water-use relative to trees that received 80% ET. However, there was a comparable water-use between 100% ET and 80% ET in HLB-affected and non HLB trees in Fall 2020. Estimates of 24-hour sap flow data showed that trees used available water between 10:00 and 20:00 hours in April 2021 with the highest peaks at 13:00 and 15:00 hours. A correlation between water-use and stem water potential for Spring 2021 gave a correlation coefficient of r= -0.57 and an R^2=0.32. For HLB-affected trees, irrigating at 80% ET is appropriate and may save water for other uses.

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