

Using Climate Information to Determine Irrigation Requirements for Citrus in Florida

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Florida ranks first in citrus production, with nearly 68% of all U.S. citrus growing in season 2005-2006. Most of the citrus groves are located from central to south Florida, and agricultural irrigation permitting is regulated by three of Florida's five water management districts. Most of the permitting for citrus production in Highlands, Polk and Hillsborough Counties is conducted by the Southwest Florida Water Management District (SWFWMD), and quantities are based on the District's AGMOD computer program. In 2003, the SWFWMD implemented new permit criteria so that permitted amounts were more representative of actual water use. This paper compared grower reported citrus irrigation water use in Highlands, Polk and Hillsborough counties from 1994 through 2005 with permitted and theoretical irrigation requirements calculated by a daily water balance. Two different sets of crop coefficients (K_c) developed for citrus in Florida were compared in the daily soil water balance calculation of theoretical irrigation requirements. The percentage of irrigated area considered in this study ranged from 40% to 60% to simulate a range of grower practices. Meteorological data from two weather stations and additional rainfall information from 50 locations within the three counties was used in the water balance. Missing and error values in the meteorological data were filled with weather generators. The multiannual average water consumption (including cold protection water use) from growers ranged from 243 mm (Hillsborough) to 406 mm (Highlands) and the multiannual average irrigation requirement permits (without cold protection) ranged from 295 to 557 mm. The simulated gross irrigation requirements under different scenarios of location- K_c -wetted areas were variable but mostly lower than the limits established by the district, except from some scenarios for Polk County, whose maximum simulated irrigation value reached 578 mm y^{-1} . In general, permitted limits recommended by the SWFWMD seem to be reasonable for the actual water use by growers in these Counties.

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