## USING PREDAWN WATER POTENTIAL AS A MEANS OF SCHEDULING IRRIGATION FOR DRIP

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## **Abstract**

Current irrigation practices balance rainfall amounts and water loss due to crop evapotranspiration with supplemental irrigation (checkbook). While this method has been successful at providing high crop yields, there is evidence that plant-based irrigation triggers could provide a means to conserve water resources, while maintaining profitable yields. Leaf water potential has been shown to integrate a plant's total environment such that differences in evaporative demand, rooting depth, soil moisture and growth stage specific water requirements will be accounted for. Pre-dawn water potential ( $\Psi_{PD}$ ) has been considered the best available measurement of crop water status for trees; however, its use for irrigation scheduling in cotton is limited. Additionally, canopy temperature has been shown to provide an indirect indication of plant water status in arid regions; however, its usefulness has not been clearly demonstrated in the southeastern United States. To this end, cotton grown in Southern Georgia was irrigated according to the University of Georgia's checkbook recommendation, as well as by three distinct irrigation thresholds based on  $\Psi_{PD}$  (-0.5, -0.7, -0.9 MPa). In addition, canopy temperature was monitored throughout the growing season for use in modifying the crop water stress index (CWSI) for cotton grown in humid regions. Our results suggest that: 1) using  $\Psi_{PD}$  as a means of scheduling irrigation decreased water usage 7% (-0.5 MPa threshold) to 21% (-0.9 MPa threshold) relative to the Checkbook for the 2013 growing season 2) canopy temperatures show potential for usage in scheduling irrigation. Specifically, all treatments exhibited identical seasonal CWSI values, seedcotton, and lint yield, 3) current irrigation practices may potentially be modified to allow for greater water savings, without yield losses.