ASSESSING THE UTILITY OF PRIMED ACCLIMATION FOR IMPROVING WATER USE EFFICIENCY IN A SENSOR-BASED IRRIGATION SCHEDULING SYSTEM

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Abstract

Important steps for producers after establishing a good plant stand are to promote healthy root development and canopy growth. A type of irrigation management strategy called Primed Acclimation aims to limit water availability early in the growing season to promote root development, which potentially helps prepare plants for episodic drought in years with limited water. Recent advances in continuous and remote soil moisture monitoring will allow for a more definitive assessment of 1) the utility of the primed acclimation strategy and 2) the thresholds needed to achieve the maximum benefit from this strategy. The goal of this project was to quantify the effects of primed acclimation irrigation treatments on cotton physiology such as plant height, total nodes, boll distribution, and yield. Treatments were implemented at University of Georgia's Stripling Irrigation Research Park (UGA SIRP) under a variable rate center pivot irrigation system. The treatments were T1 (-20 cb pre bloom), T2 (-40 cb pre bloom), T3 (-70 cb pre bloom), T4 (-100 cb pre bloom), and T5 (dryland). All irrigated plots were irrigated with -35 cb triggers upon the first week of bloom. The UGA Smart Sensor Array (SSA) consisting of smart sensor nodes containing three Watermark moisture sensors installed in a probe that transmitted to a central Gateway were used to monitor soil tension. The UGA SSA's were used to trigger irrigation events at predetermined centibar readings, which correlated to the earlier mentioned treatments. Infield physiological data such as plant height, total nodes, and boll distribution was were collected biweekly, while remote sensing data was were collected weekly and included Normalized Difference Vegetation Index (NDVI), and aerial RGB photography.