# PRIMED ACCLIMATION: ASSESSING A SENSOR-BASED IRRIGATION SCHEDULING SYSTEM WITH LIMITED EARLY SEASON IRRIGATION

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## Abstract

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 plant growth boll distribution, and yield. Treatments were implemented at University of Georgia's Stripling Irrigation Research Park (UGA SIRP) in 2014 and 2015 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 at different depths installed in a probe that transmitted to a central Gateway were used to monitor soil water potential. The UGA SSA's were used to trigger irrigation events at predetermined centibar readings, which correlated to the earlier mentioned treatments. The lowest prebloom irrigation water potential trigger (-100 kPa) resulted in less water being applied than T1 without negative impacts on growth and yield. In contrast, the season long dryland treatment altered boll distribution patterns and negatively impacted yield and water use efficiency in 2014 due to episodic drought events that occurred during flowering.