PRIMED ACCLIMATION IRRIGATION STRATEGIES: FURTHER EVALUATION

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Abstract

Establishing a plant stand is the first step in cotton production to ensure a yield environment that is productive with healthy biomass above ground as well as healthy roots. Primed acclimation irrigation strategies have been demonstrated as a viable method of irrigation for cotton production that can lead to increased water use efficiency (WUE) and higher drought tolerance levels during dry periods. 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 full irrigation (T1), semi-primed (T2), full primed (T3), optimally primed (T4), and dryland (T5). Three Watermark moisture sensors installed in a probe (the UGA Smart Sensor Array (SSA)) were used to monitor soil tension. The UGA SSA's were used to trigger irrigation events at predetermined centibar readings which included treatments 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. Above ground biomass collections were collected at biweekly intervals beginning four weeks after emergence. Minirhizotron tubes were installed in each of the plots. Pictures were taken twice in 2014 and biweekly in 2015 to coincide with biomass collections to determine if there were visible differences in the rooting development between the irrigation treatments. Initial observations demonstrated significant differences between dryland and irrigated treatments with no yield penalty for withholding irrigation applications early in the season.