EVALUATING VARIETY PLACEMENT IN COTTON USING PRECISION MULTI-VARIETY PLANTING TECHNOLOGIES

Julianna B. Corbin
Michael T. Plumblee
Kendall R. Kirk
Tyler S. Soignier
Clemson University
Blackville, SC

Abstract

Rapidly advancing planter technologies provide growers the ability to switch varieties on-the-go while planting. Planter technologies, typically purchased and used in corn planting, may have benefits in other crops and improve agronomic components of crop production. Considering that cotton (*Gossypium hirsutum L.*) seed costs account for up to 20% of the continually rising input costs, maximizing the lint yield of a planted seed is essential to competitive and profitable crops for farmers in the USA. To understand the possible benefit of multi-variety planting in cotton a study was initiated to evaluate the performance of multi-variety cotton planting by planting uniform and non-uniform variety strips in and out of irrigation boundaries.

This research was conducted in 2020 at the Edisto Research and Education Center in Blackville, SC to determine if selecting different cotton varieties based on irrigation within the same field is profitable or beneficial to cotton farmers. A single field was used for this trial, and the cotton was planted on June 1, 2020. The 13 treatments were replicated four times and were as follows: Deltapine (DP) 1646 B2XF, Deltapine (DP) 1835 B3XF, NexGen (NG) 3729 B2XF, Stoneville (ST) 5600 B2XF, Phytogen (PHY) 580 W3FE, DP 1646 (irrigated) + ST 5600 (dry), DP 1646 (irrigated) + PHY 580 (dry), DP 1835 (irrigated) + ST 5600 (dry), DP 1835 (irrigated) + PHY 580 (dry), DP 1835 (irrigated) + DP 1646 (dry), NG 3729 (irrigated) + DP 1646 (dry), NG 3729 (irrigated) + ST 5600 (dry), and NG 3729 (irrigated) + PHY 580 (dry). Throughout the growing season cotton was irrigated by turning the end gun off the pivot and only irrigating the cotton under the irrigation system. Fertility, insects, weed control, plant growth regulators, and harvest aids were managed based on the South Carolina Cotton Growers' Guide. The data collected throughout the growing season included stand counts, bloom and harvest heights and nodes, and lint samples at harvest. The data in this study was subjected to analysis of variance, with means separated using Fisher's Protected LSD at $\alpha = 0.05$.

The 2020 growing season had timely rainfall in the area, leading to optimum growing conditions. After analysis of lint yield, the combination of DP 1835 (irrigated) + DP 1646 (dry) resulted in the highest lint yield, 3358 kg/ha, of the treatments studied. As an individual variety, DP 1646 B2XF produced the greatest lint yield. Furthermore, other varieties produced approximately the same lint yield in dryland conditions as under irrigation. Soil electrical conductivity (soil EC) influenced cotton lint yield, regardless of variety and treatment. Therefore, soil EC could be used as a prescription data layer in future studies. Overall, it was concluded that multi-variety planting technologies appear to be an effective tool to maximizing cotton yield when appropriate varieties are selected for irrigated and dryland conditions. Continued evaluation of multi-variety prescription development and zone delineation is needed to be able to provide recommendations for South Carolina cotton growers.