

EFFECT OF VARIETY, IRRIGATION, AND PLANT GROWTH REGULATOR USE ON COTTON PERFORMANCE

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Abstract

In a recent survey conducted by Cotton Incorporated, cotton variety selection and management was rated in the top three concerns from cotton producers nationwide. The main reason for this concern was the rapid turnover of commercially available cotton varieties due to advancements in transgenic weed and insect traits. Therefore, a project was funded through Cotton Incorporated to evaluate several experimental and newly released varieties under irrigated and non-irrigated conditions. In addition to variety performance, response to plant growth regulators (PGRs) was also evaluated for each variety entered. The study was set up in a split-plot design for irrigation with a factorial arrangement of treatments at 10 locations across the cotton belt during 2012 and 2013. Five varieties were evaluated depending on region, which included Southwest, Mid-South, and Southeast United States. Plant growth regulator applications were untreated, a standard regime (one application at bloom) and an aggressive regime (one application prior to bloom followed by an application at bloom). Independent variables measured included plant heights at bloom and harvest, number of first fruiting node, total nodes, and node of uppermost harvestable boll as well as cotton lint yield. In general, statistical analysis revealed no two-way or three-way interactions among independent variables measured, regardless of region. Main effects of most variables were significant for variety and irrigations as well as PGR regime. Overall, irrigation increased total number of nodes in all locations, increased plant height in six of ten locations, and improved overall yields in four of 10 locations (an average of 222 lbs/A in those four locations). Plant growth regulators affected plant height in all locations, as in most locations the standard PGR regimes reduced plant height over the untreated, and in some locations the aggressive regime additionally reduced height. Lint yield was affected by PGR regime in six of ten locations, yet effects were not consistent across locations as PGRs improved yields in some locations and reduced yields in others. The main effect of varieties statistically impacted yields in all locations, and in general no two- and three-way variety interactions were

observed. However, an interaction of variety and PGR regime was significant in the two Mississippi locations, as lint yield of most varieties were not affected by PGR regime, yet standard and aggressive PGR regimes negatively impacted yield in FM 1944 GLB2 in 2012 and in NG 1511 B2RF and DP 0912 B2RF in 2013. This study provided information with respect to variety performance in irrigated and non-irrigated situations, as well as providing data on plant growth of varieties as well as ideas on managing varieties with PGRs.