EFFECT OF IRRIGATION AND PLANT GROWTH REGULATOR USE ON VARIETY 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, plant growth regulator needs were also determined for each variety entered. The study was set up in a split-plot design for irrigation with a factorial arrangement of treatments at 8 locations across the cotton belt. Five varieties were evaluated depending on region, which included Southwest, Mid-south, and Southeast United States. Plant growth regulator applications were untreated, standard (16 fl oz/Acre at bloom) and aggressive (16 fl oz/Acre at early square followed by 16 fl oz/Acre at bloom). Independent variables measured included plant heights at bloom and harvest, first fruiting nodes, total nodes and node of uppermost harvestable boll as well as cotton lint yield. 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 irrigation treatment. At all locations, cotton plants were taller under irrigated conditions. The aggressive plant growth regulator treatment significantly reduced plant height by harvest across varieties. Varieties produced higher lint yields under irrigated growing conditions. Varieties separated in regards to yield potential and PHY 499 WRF was the highest yielding variety across regions. This study enabled us to determine varieties that produced high cotton yields in both irrigated and non-irrigated situations. It was determined that some varieties respond better to plant growth regulators than others. Irrigated cotton yields were on average 400 lbs/Acre better under irrigated versus dryland conditions in the Mid-south region.