

COTTON CULTIVAR PERFORMANCE UNDER IRRIGATED AND NON-IRRIGATED CONDITIONS**Blake McClelland****University of Arkansas Division of Agriculture****Keiser, AR****Tom Barber****University of Arkansas Division of Agriculture****Little Rock, AR****Darrin Dodds****Mississippi State University****Mike Jones****Clemson University****Florence, SC****Mississippi State, MS****Christopher L. Main****Phytogen Seed****Abstract**

Research was conducted at the University of Arkansas, Clemson, Mississippi State and the University of Tennessee in 2012 and 2013 that evaluated certain cotton cultivars to determine the cultivars response under irrigated and non-irrigated conditions. Cultivars that were tested at all locations included: DP 1137 B2RF, DP 1311 B2RF, DP 1321 B2RF, FM 1944 GLB2, ST 4946 GLB2, ST 6448 GLB2, PHY 333 WRF, PHY 339 WRF, and PHY 499 WRF. Additional varieties were tested at each location that were suited to that respective location, however, only the varieties that were tested at all locations were analyzed. The study was conducted using a split plot design. The irrigated and non-irrigated scenarios were the main plots and the varieties were the sub-plots. The trials in Arkansas and Mississippi were furrow irrigated using a two inch moisture deficit. The trial at Clemson was conducted under a lateral irrigation system using a rate of one inch of water every two weeks. The trial at Tennessee was conducted using drip irrigation at a rate of one inch of water per week. Each trial was harvested using a spindle type cotton picker and grab samples were taken for fiber analysis. Box mapping was also conducted to obtain results pertaining to fruiting by position. Results of the main plots according to the box mapping data showed that seed cotton by weight was significantly greater in the irrigated conditions. First position bolls had greater seed cotton weight than the other positions. Also shown, seed cotton weight was greater on nodes 9-12 in both conditions. However, nodes 5-8 in the non-irrigated conditions had significantly greater seed cotton weight than in the irrigated conditions. When separated by varieties, varietal differences were shown in plant height, yield, turnout and quality. Although there were significant differences between the varieties in plant height, one variety was not significantly different from all of the other varieties. Under both irrigated and non-irrigated conditions DP 1137 B2RF was the tallest variety. Under all conditions the Phytogen varieties all produced over 1700 lbs of lint/ac. In both the irrigated and non-irrigated scenarios the Phytogen varieties were the highest yielding varieties, with PHY 499 WRF yielding the highest in the irrigated trial and PHY 333 WRF yielded the highest in the non-irrigated trial. Turnout was also analyzed. There was no significant difference, in turnout, between the irrigated and non-irrigated conditions. Varietal differences were shown and most varieties actually had better turnout in the non-irrigated scenario. Uniformity, length, and strength were all significantly impacted by irrigation. The varieties showed only varietal differences and no variety was significantly different than the all of the other varieties. Micronaire was significantly higher in the non-irrigated scenario. However, variety difference was very prevalent. Some of the same varieties were not significantly different in both scenarios, but, were significantly different from other varieties. Overall the data showed that even though the irrigated scenario produced significantly higher seed cotton weight, both scenarios were similar in distribution of bolls. Each variety produced well in in both scenarios. As varieties change and new varieties come into the industry, evaluation will be needed to determine which varieties will perform best in the conditions across the Cotton Belt.