EVALUATION OF GROWTH AND BOLL DISTRIBUTION OF MODERN COTTON VARIETIES IN GEORGIA

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Abstract

Prior to 2010, approximately 85% of Georgia's cotton acreage was planted to a single full-season variety, DP 555 BR. With the removal of this variety from the market, Georgia's cotton growers must now choose from many other varieties that differ in maturity, growth potential, management requirements, and response to environmental stress. Due to the increasingly rapid release of modern varieties onto the market, evaluation of plant growth and fruiting characteristics is necessary in order to provide timely, accurate, and research-based information to growers. Evaluation of such parameters could provide insight on how growers should manage new varieties with plant growth regulators, irrigation, or other agronomic inputs.

As part of the UGA On-Farm Cotton Variety Performance Evaluation Program, 11 top-performing cotton varieties were planted in growers' fields in both irrigated and non-irrigated environments across all regions of Georgia's cotton belt. All varieties were planted in four- or six- row plots, and were replicated three times. Prior to harvest, the authors collected plant height, number of nodes, node of first sympodia, total bolls per plant, and mapping of boll distribution on 10 plants per plot replicated three times for each variety in three environments: Early County (high-yielding dryland), Colquitt County (low-yielding dryland), and Sumter County (high-yielding irrigated). Varieties included in this trial; PHY375WRF, PHY499WRF, PHY565WRF, DP0912B2RF, DP1050B2RF, DP1137B2RF, DP1252B2RF, AM1511B2RF, FM1740B2F, FM1944GLB2, ST5458B2RF.

Data were subjected to Analysis of Variance, and means were separated using Fisher's Protected LSD at $p < 0.05$. Regression analysis was used for boll distribution. Plant height was significantly different among several of the varieties tested, with a range of approximately six inches between the tallest and shortest variety, suggesting that overall growth potential does vary among modern varieties. Only numerical (non-statistical) differences were observed for the number of main-stem nodes, suggesting that some varieties may exhibit more compact fruiting than others. The node of first sympodia (often used as a partial measurement of maturity) was also significantly different among some varieties. The total number of bolls per 10 plants was similar among the varieties tested (only numerical differences observed), suggesting that yield differences may be more related to lint percentage and/or other characteristics unrelated to boll numbers. Only subtle differences between varieties were observed with regard to position 1 boll distribution across plant nodes. Most of the differentiation was related to the node of first retained boll, and the uppermost node than retained harvestable bolls. Boll distribution across most other plant nodes was similar among all varieties.

Although significant differences were observed in plant height and node of first sympodia, most varieties had a similar number of main-stem nodes and bolls. Distribution of position 1 bolls was similar, with the subtle exception of the far bottom and top nodes of the plant. Differences in maturity may be subtle among modern varieties, and therefore other factors may be more closely related to yield performance and stability. However, this data could provide insight on how these varieties may need to be managed.