

2015 BELTWIDE ON-FARM COTTON VARIETY PERFORMANCE

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Abstract

Variety selection has become an increasingly more important challenge facing cotton producers across the U.S. Modern cotton varieties are currently released onto the marketplace very rapidly, due to increased competition among the major seed companies, advancements in herbicide tolerant traits and multi-gene insect technologies, and accelerated advancements in breeding for higher yield potential, nematode tolerance, and fiber quality improvements. Modern cotton varieties vastly differ with regard to maturity, response to water deficit stress, and growth management requirements. Due to the rapid release of cotton varieties onto the marketplace, there is little time to effectively evaluate performance of new varieties, nor to determine how to position new varieties into environments where they are likely to perform competitively. Further complicating the matter is the rising seed and associated technology costs of seed, shifting a larger proportion of the investment in growing cotton to the beginning of the season, unlike other agronomic input decisions which can be adjusted for yield expectations throughout the season. Technology fees are again expected to increase in 2016 due to the release of new auxin herbicide tolerance traits. Variety selection is also a very expensive decision that has a significant impact on profitability in several regards. During 2015 in North Carolina for example, improper variety selection could have cost growers anywhere from \$120 to \$156 per acre on average, depending on the degree of variety selection error. Furthermore, the costs of improper variety selection could exceed that of any other single agronomic input in a given year. Variety decisions determine the maximum yield potential for a particular field for that season, therefore there is a great need for timely and robust variety performance information across the belt in order to maximize yields and reduce losses associated with improper variety selection.

Many members of the Extension Cotton Specialists Working Group and others, with the support of Cotton Incorporated, established a large number of replicated on-farm cotton variety trials within most states in every region of the cotton belt (Southeast, Midsouth, Southwest US). Several varieties (representing most, if not all, brands and technologies) were selected based on grower interest, needs within each state, industry interest, prior performance in OVT small-plot trials, and the preference of each state's cotton specialist or regional agronomist. These varieties were planted in replicated (two to four replicates depending on field variability) on-farm trials in producers' fields in representative soils and geographies within each region. Each trial was managed by the cooperating grower with the input of the Extension Cotton Specialist, Regional Agronomist, crop consultant, and/or the County Extension Agent. Results from individual states were made available through several outlets, but all trials that were supported by Cotton Inc. were included in the SeedMatrix™ database, which allows for customized evaluation of varieties across selected environments. Contrary to Official Variety Trials, this on-farm testing program focused primarily on the most competitive varieties as determined by prior performance in OVT or other trials, captured a vast array of environments, and evaluated performance under management of the grower with regard to technology, whereas OVT can generally evaluate many more varieties (including more experimental varieties) based on yield potential alone (without regard to technology) and in fewer environments.

During the 2015 production season, this program continued to effectively capture and evaluate variety performance across a broad range of yield environments, soil types, geographies, planting dates, harvest dates, grower management (growth regulators, weed management, insect management, fertility), degree of irrigation, rainfall patterns, water and heat stress, etc., allowing for robust assessment of variety stability to be generated. Some varieties were observed to consistently perform at or near the top, indicating a high degree of stability as they performed well across many of the aforementioned factors. Other varieties may only perform well in specific environments, suggesting that some varieties may need to be positioned only in particular types of environments such as high yield heavily irrigated environments versus dryland environments that encounter drought stress, or

based on their most yield-limiting factor (response to irrigation or water deficit, nematode tolerance, etc) in order to be competitive. This is an ongoing program that has clearly demonstrated a significant economic impact and return to growers that utilize these trials as a means for variety selection.

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