

Program 13C-2

► **Factors Affecting Cotton Variety Performance**

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One of the most important decisions that cotton producers make occurs before the growing season even begins. Variety selection, specifically which varieties are selected for each field and specific situation, will set the pace for the entire year. A closer look at factors affecting variety performance is necessary to consistently put the right variety in the right field.

Selecting ideal varieties today is more complicated than in the past. They are offered with any number of genetic technologies and seed treatments, some of which may not be important to you and some of which are critical. Choosing among these technologies, such as Roundup Flex, Liberty Link, GlyTol, or Conventional, etc., can help narrow the field in selecting a variety. However, after the “technology” decision is made, there remains a large number of varieties that could potentially be planted on your farm.

Research being conducted in Louisiana aims to categorize cotton varieties and to determine where they are best suited for maximum yield potential and fiber quality. One of these trials was conducted with Mr. Dennis Burns, LSU AgCenter county extension agent, at an on-farm location in Tensas Parish to evaluate cotton variety performance on different soil types. Rather than averaging data from a soil type, e.g. clay soils, from throughout the state of Louisiana, we were able to test 6 cotton varieties on different soils within the same field. This is important because most of the other factors that affect the performance of varieties were constant (such as planting date, pest pressure, rainfall, nighttime temperatures, etc.).

There were large differences in lint yields on different soil types. Averaged across varieties, the highest yields were obtained on a Tunica clay (1132 lb/A), followed by a Sharkey clay (999 lb/A), a Commerce silt loam (945 lb/A), and a Bruin silt loam (765 lb/A). The yields of the varieties, averaged across all of the soil types, ranged from 1281 to 746 lb/A. The highest-yielding variety on average, Stoneville 5288, was also the highest-yielding for all soil types. However, some varieties bucked the trend of highest yields on the clay soils compared to the silt loam soils. Deltapine 1048 and Stoneville 5458 yielded higher on the Commerce silt loam, relative to their yields on the clays, than the other varieties. This suggests that their best fit is on lighter soils.

Undoubtedly, yield potential is the most important characteristic to consider for variety selection. Another important consideration - a tiebreaker of sorts - is the level of stability/consistency of a variety. We estimated the consistency of cotton varieties across the soil types to evaluate how durable they would be in a range of conditions or in fields with variable soils. One important point to consider is that stability is a desirable trait, but it is only important if a variety has high yield potential in addition to consistent yields. The variety that was most consistent (interpret as equally adapted to all soil types) was Deltapine 1048, however, yields were somewhat lower compared to other varieties. PhytoGen 485 was also very consistent. Stoneville 5288 and 5458 were consistent across soil types, which is important considering they both had high average yields across the field. The least stable varieties were PhytoGen 565 and Deltapine 0935 (almost 2X as variable). Deltapine 0935 had high average yields on the clay soils, but yields were much lower on the loamy soils which contributed to the high levels of variability.

Replicated small-plot research trials are an extremely important source of information when making variety selection decisions. These trials are used by seed company representatives

making variety advancement decisions and by crop consultants and growers who are interested in evaluating relative varietal performance in local conditions. A major benefit of these trials is the ability to test a large number of varieties, including pre-release experimental lines, and get information on their growth and management curve. At the Dean Lee Research Station in 2010, we conducted 4 cotton variety trials: an early and a medium-full maturity trial on a Coushatta silt loam and a Latanier silty clay loam. In addition to yield and fiber quality traits, we gathered information to estimate the growth potential of the varieties in the trial for plant growth regulator management.

Ultimately, there are many factors that should go into selecting a mix of varieties for your farm. Utilizing all available sources of information (University Variety Trials, previous performance in your area, etc.) is important. A variety might not always make a bumper crop, but investing the time to research the varieties and their characteristics can start things off on the right track.

Program 1C-2

► Programs For Managing Glyphosate-Resistant Italian Ryegrass In The Mississippi Delta

Presented by Dr. Jason A. Bond

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Italian ryegrass (*Lolium perenne* ssp. *multiflorum*) is an erect winter annual with a biennial-like growth habit. It is often planted as a cover crop, as a temporary lawn grass, for roadside restoration, or for soil enrichment; however, it often escapes cultivation and becomes established in fallow fields as a winter weed. Italian ryegrass has a wide range of adaptability to soils, and it thrives in fertile soils in regions with mild climates. Plants emerge in the fall and grow vigorously through winter and early spring. Individuals of the species are highly competitive for nutrients, water, and sunlight.

Glyphosate-resistant (GR) Italian ryegrass was first documented in the United States in Oregon in 2003. Regionally, two populations of GR Italian ryegrass exhibiting a three-fold resistance were identified in field crops in Washington County, Mississippi, in 2005. Since the initial confirmation in 2005, field observations suggest some populations are resistant to much higher glyphosate rates. Survey data from 2009 indicate that GR Italian ryegrass is now present in 12 counties in the Mississippi Delta. It has also become problematic in other southern states. Populations of GR Italian ryegrass have been confirmed in at least one county/parish in Arkansas, Louisiana, and North Carolina during the last three years. Several other counties/parishes in Arkansas, Louisiana, and Tennessee are also suspected to contain GR Italian ryegrass.

Dense populations of GR Italian ryegrass are problematic for producers. This weed can jeopardize burndown programs, and few affordable postemergence herbicides are available. Fields containing GR Italian ryegrass not controlled at burndown will have significant plant residue at planting. Residue will impede planting practices, contribute to competition between crop seedlings and established GR Italian ryegrass, and hinder herbicide programs due to inadequate coverage. Therefore, it is important to identify effective herbicide and/or cultivation programs to adequately control GR Italian ryegrass to prevent competition and yield loss.

Research to address management of GR Italian ryegrass was initiated at the Delta Research and Extension Center in Stoneville, Mississippi, in 2005. The major conclusions of research from 2005 through 2008 were (1) postemergence options in the spring are extremely limited and require at least two herbicide applications to approach complete control and (2) residual herbicides applied in the fall offer the best opportunity for controlling GR Italian ryegrass. More recently, the research emphases have transitioned to focus on programs for managing GR Italian ryegrass. These include integration of postemergence and residual herbicides,