GEORGIA COTTON

February 23, 2001 **http://www.griffin.peachnet.edu/caes/cotton**

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Cotton Producers Must Sign New Technology Agreement for 2001. *(Brown and Roberts)* Cotton growers who choose to purchase Bollgard and/or Roundup Ready varieties in 2001 must sign a new technology agreement with Monsanto. Dealers have the appropriate forms and specific details. The new agreement/contract contains two important changes, a new format or method for settling complaints and new refuge requirements for Bt acreage.

The Complaint Process now requires that a producer notify the company within 15 days after a problem is first observed. In the event that the problem is not satisfactorily resolved 30 days after the initial complaint is registered, the grower (the language actually states "any party") may file for arbitration under provisions of the Federal Arbitration Act following procedures established by the American Association of Arbitrators. The producer and company equally share the costs of filing such a case, costs which can range from a "few hundred to a few thousand dollars." An arbitration hearing involves testimony from the two parties and any other pertinent individuals (ex. dealers, experts, etc.) in the presence of an arbitrator(s) who hears the facts and renders a decision or judgement. The process is considered binding arbitration, meaning that the decision of the arbitrator(s) is final and legally binding for the parties involved.

New Refuge Requirements for Bollgard Cotton. *(Roberts)* Monsanto was granted a 5-year conditional registration for Bollgard cotton prior to the 1996 growing season which expired in late 2000. A 1-year extension has been granted by the EPA, but the resistance management require-ments have changed for the 2001 growing season. Growers planting Bollgard cotton in 2001 must follow the resistant management practices found in the new technology agreement. The 2001 changes include minimum distance requirements for the refuge from the Bollgard fields, and minimum width requirements of the refuge when using the 95:5 options. There is also opportunity to work with neighboring growers using a "Community Refuge Plan." Three refuge options are available.

20% Sprayed Refuge: Plant at least 20 acres of non-Bollgard cotton as a refuge for every 80 acres of Bollgard cotton. This refuge may be treated with any insecticides (excluding foliar B.t.k. products). All Bollgard fields must be within one mile (preferably within one-half mile) of the associated refuge.

5% Unsprayed Refuge: Plant at least 5 acres of non-Bollgard cotton (as refuge cotton) for every 95 acres of Bollgard cotton. This refuge may not be treated with any Lepidopterous-active insecticide labeled for the control of tobacco budworm, cotton bollworm, or pink bollworm. The unsprayed refuge must average at least 150 feet wide, and all associated Bollgard fields must be within one-half mile of the unsprayed refuge.

5% Embedded Refuge: Plant at least 5 acres of non-Bollgard cotton (as refuge cotton) for every 95 acres of Bollgard cotton. Plant the refuge cotton embedded as a contiguous block within the Bollgard field or within the field unit. A field unit is defined as any group of fields that are contained within one mile squared (one mile by one mile) area. The 5% embedded refuge must be at least 150 feet wide. Whenever the entire associated Bollgard field or field unit is treated with any insecticide, the embedded refuge may be treated with the same insecticide at the same rate within the same 24 hour period.

Every Bollgard field must have a corresponding non-Bt refuge field applicable to one of the three refuge options offered. Thus, consideration must be given as to where and what refuge option will be used on individual fields or farms. It is possible that different refuge options could be used by the same grower on different farms, but each Bollgard field must have an associated refuge.

Refuge options are designed to delay the development of resistance by ensuring that some Lepidopteran populations are not exposed to the B.t.k. protein. In theory, susceptible moths emerging from the refuge will dilute or reintroduce susceptibility into populations of resistant moths which may emerge from a Bollgard field. We are compelled to follow resistant management guidelines to preserve efficacy of this technology. The 2001 Insect Resistance Management Requirements are explained in more detail in the technology agreement package. Be sure to carefully read and follow these requirements.

Variety Selection. *(Jost)* Variety selection is one of the most critical decisions that a grower makes concerning the production of a crop. While the past several years in Georgia serve as evidence for the dramatic impact of the environment on yield and quality, environmental factors cannot be controlled by the producer. Variety selection, however, determines the potential maximum for yield and quality. Management strategies and weather then determine how far below this potential maximum that the yield and fiber quality ultimately fall. Thus, it is extremely important for a producer to chose a variety that has the greatest potential yield and quality.

It is not feasible for a producer to examine every available variety on his particular farm. Therefore, the best estimate of variety performance is to extrapolate data from variety trials and hope that the trends observed therein will hold true across multiple locations.

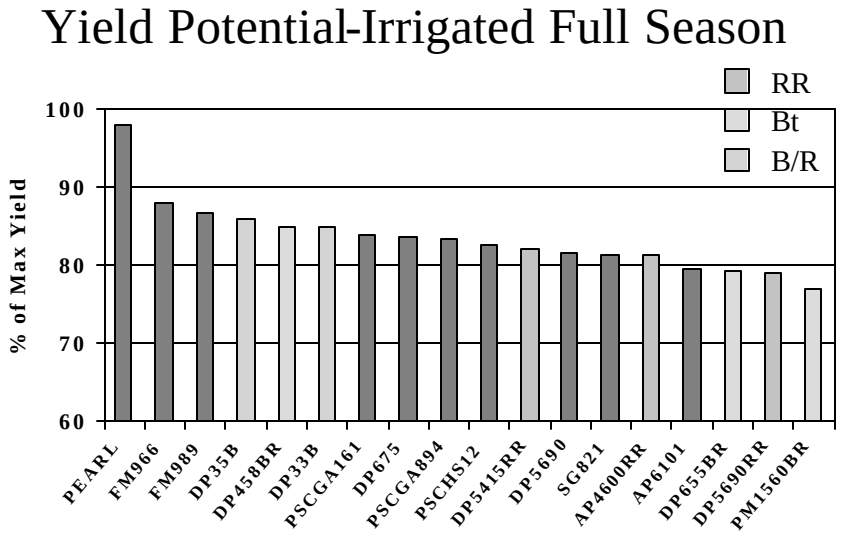
The University of Georgia, County Extension Agents, companies, and consultants conduct numerous variety trials each year. While these tests provide valuable data, there is often a lack of consistency between these

trials in terms of which varieties are evaluated. Therefore comparisons of multiple varieties across different locations is difficult. The University of Georgia Official Variety Trials (OVTs) are conducted in four locations each year - Tifton, Athens, Plains, and Midville. In these trials the same varieties are evaluated at all four locations, and they are further grouped as to being either short- or full-season. These data can be accessed on the UGA Cotton Web Page at **http://www.griffin.peachnet.edu/caes/cotton**.

The following data were taken from the 1999 and 2000 OVTs. The data from these trials were examined in an effort to rank varieties in terms of yield and fiber quality potential across the different environments. An "environment" was considered to be a location within a given year.

Lint Yield. In each environment all varieties were compared to the highest average yield for that environment, which was considered to be the "maximum potential yield". The percentage of that maximum yield that each variety attained was calculated. These percentages were then averaged and analyzed across all environments. Therefore, if a variety averaged 100% across all environments, this would indicate that it was the top yielding variety in every environment. Figure 1 shows the yield potential of 18 full season varieties under irrigated conditions.

Figure 1.



This chart shows that the average percent of the highest yield ranged from 78 to 98%. What is interesting is that several of the stacked (B/R) and straight roundup ready (RR) varieties had some of the lowest percentages. This is not to say that these are inherently low yielding varieties, but rather that they may be more subject to environmental effects than other varieties. These data further suggest that it is not wise to

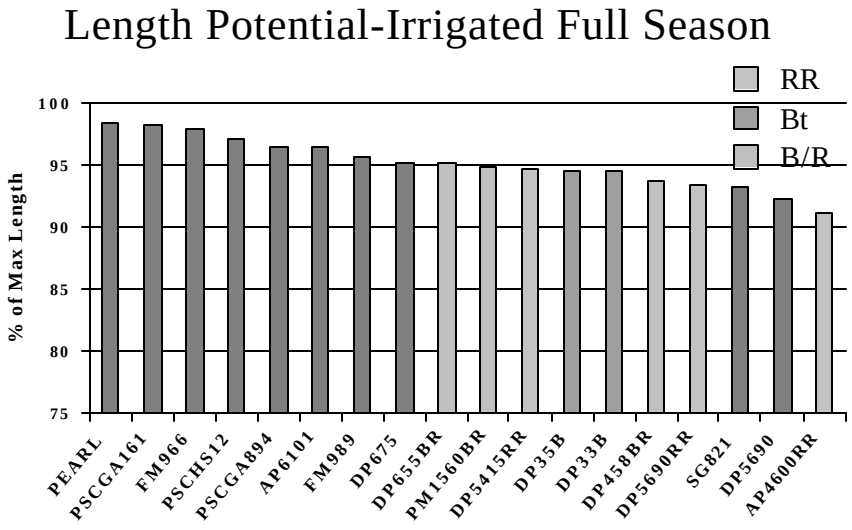
choose a variety based solely on the technology that it contains. In other words, buy genetics first then technology.

Fiber Length. These data were examined in the same fashion as the yield data. The percentage of the maximum fiber length that each variety attained in a given environment was calculated. These percentages were averaged and analyzed across all environments. The data for fiber length are shown in Figure 2.

Percentages of length potential averaged between 92 and 97%. At first glance this may appear to be relatively insignificant, since all varieties averaged over 90% of the potential maximum fiber length. However, if the maximum fiber length was 36 in a given environment and a particular variety attained only 92% of that, its length would be 33 which is in the discount range. Again, of particular interest is where in the range of data that the majority of the transgenic varieties fell.

Observations similar to the yield and fiber length data were found for fiber strength. The micronaire data showed somewhat different trends, where some of the higher yielding varieties tended to have higher micronaire readings. This stands to reason in that fibers possessing higher micronaire are thicker and thus weigh more leading to increased yields. This is an occurrence that warrants further examination.

Figure 2.



The data from the short season varieties also demonstrated trends similar to the full season varieties. Thus, a producer should closely evaluate the need for technology and weigh that against the convenience of the technology. The tremendous benefits that transgenic varieties offer to producers in fields with difficult to control weeds or heavy worm pressure are impossible to ignore. The convenience that these varieties offer does not come without some possible sacrifices such as reduced yield and quality potential.

Finally, not all transgenic or conventional varieties are the same; some are more consistent performers than others. A variety that performs well across many environments could be considered as insurance, since no two years are the same, even on the same farm. Using the concept presented here, the following varieties (by category) show particular promise for obtaining maximum yield and fiber quality.

	Short-Season	Full-Season
Conventional	PSC355 FM958	Delta Pearl FM989 FM966
Roundup Ready		DP54515RR
Bt		DP33B DP35B
Stacked	SG501BR ST4892BR	DP458BR

Seed Supplies Tight for Some Transgenic Varieties. *(Brown)* In the 2000 crop season, 80 percent of the cotton acreage in Georgia was planted in transgenic varieties, predominantly Bollgard/Roundup Ready (B/RR or "stacked") and Roundup Ready (RR) cultivars. Supply of various preferred varieties will influence plantings in the 2001 crop.

DP 458 B/RR was the most widely planted variety last year. Supply and quality of it are again questionable because of low cool germination test values, a problem attributed to dormancy of newly harvested seed. Supplies of other stacked are adequate to plentiful. Most notably, ST 4892 BR, a Stoneville stacked cotton developed from ST 474 heritage, is widely available. Keep in mind that ST 4892 BR is an early maturing cotton.

In general, quantities of RR cultivars are expected to be below demand. New RR entries from companies other than Delta Pine will be available but in limited supply for 2001. Competition will be keen in the coming years.

Statewide Incidence of Cotton Nematodes in Georgia in 2000. *(Davis)* The three nematode species that most commonly cause significant yield loss in cotton in Georgia are southern root-knot, Columbia lance, and reniform. Each year, the University of Georgia Extension Nematology Laboratory processes many soil samples submitted by farmers from cotton fields, and these samples can be used to monitor the distribution and incidence of damaging nematodes in Georgia's cotton fields. Only samples identified as being from cotton fields are included. Percent of samples with a given nematode species was calculated as the number of cotton samples in which at least one nematode of that species was found divided by the total number of cotton samples from that county.

The statewide incidence of southern root-knot in cotton in calendar year 2000 was 39.9%. The incidence of Columbia lance was 7.3 %, and the incidence of reniform was 8.1%. Short term trends are difficult to identify accurately, but it seems that the incidence of southern root-knot and reniform are increasing slightly, and the incidence of Columbia lance is actually declining slightly. These data indicate the relative incidence of these three nematodes across the state of Georgia. The incidence of a nematode species in a particular county may be much higher or lower.

Incidence is not necessarily correlated with severity because one nematode of a given species in a sample results in the same incidence calculation as 1,000 nematodes of that same species. However, if the nematode is present at all, it has the potential to develop into a problem in that field. These data represent biased sampling for two reasons: 1) many people that already know they have a nematode problem do not submit samples, and 2) some of the samples submitted were taken because a problem was suspected. However, unbiased surveys yield results similar to these.

Silverleaf Whitefly. *(Roberts)* During recent years silverleaf whitefly (SLWF) has infested cotton in Tift, Colquitt, and surrounding counties. Infestations were more widespread during the 2000 season as economic infestations were reported on late planted cotton in many southwest Georgia counties. Control of SLWF with insecticides is difficult and expensive and our most efficient strategy for managing SLWF is to avoid or reduce the risk of damaging populations. Reducing the risk of damaging SLWF infestations is especially important in areas where SLWF has been a problem in recent years. Our observations indicate that late planted cotton (June) is more likely to encounter damaging SLWF populations. Avoiding late planting dates reduces the risk of SLWF. However, environmental conditions such as moisture (lack of or surplus) sometimes force growers to plant some cotton late. In these situations growers should utilize smooth leaf varieties. In side by side comparisons, hairy leaf cottons typically have higher SLWF infestations compared with smooth leaf varieties. Cultural practices such as eliminating cultivated host plants after harvest and conserving beneficial insects also reduce SLWF risk.

Dr. Philip Jost, Extension Agronomist-Cotton, Joins Cotton Team. (*Brown*) Philip Jost Graduated with a PhD in Agronomy from Texas A&M in May 2000. He joined the UGA Crop and Soil Sciences faculty in Statesboro on January 2. His responsibilities include extension agronomy programs in cotton. He can be reached by phone at 912 / 681-5653, by fax at 912/681-0180 or by email at pjost@uga.edu. We look forward to his contributions to Georgia agriculture.

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