The University of Georgia
Cooperative Extension
College of Agricultural and Environmental Sciences

Georgia Cotton

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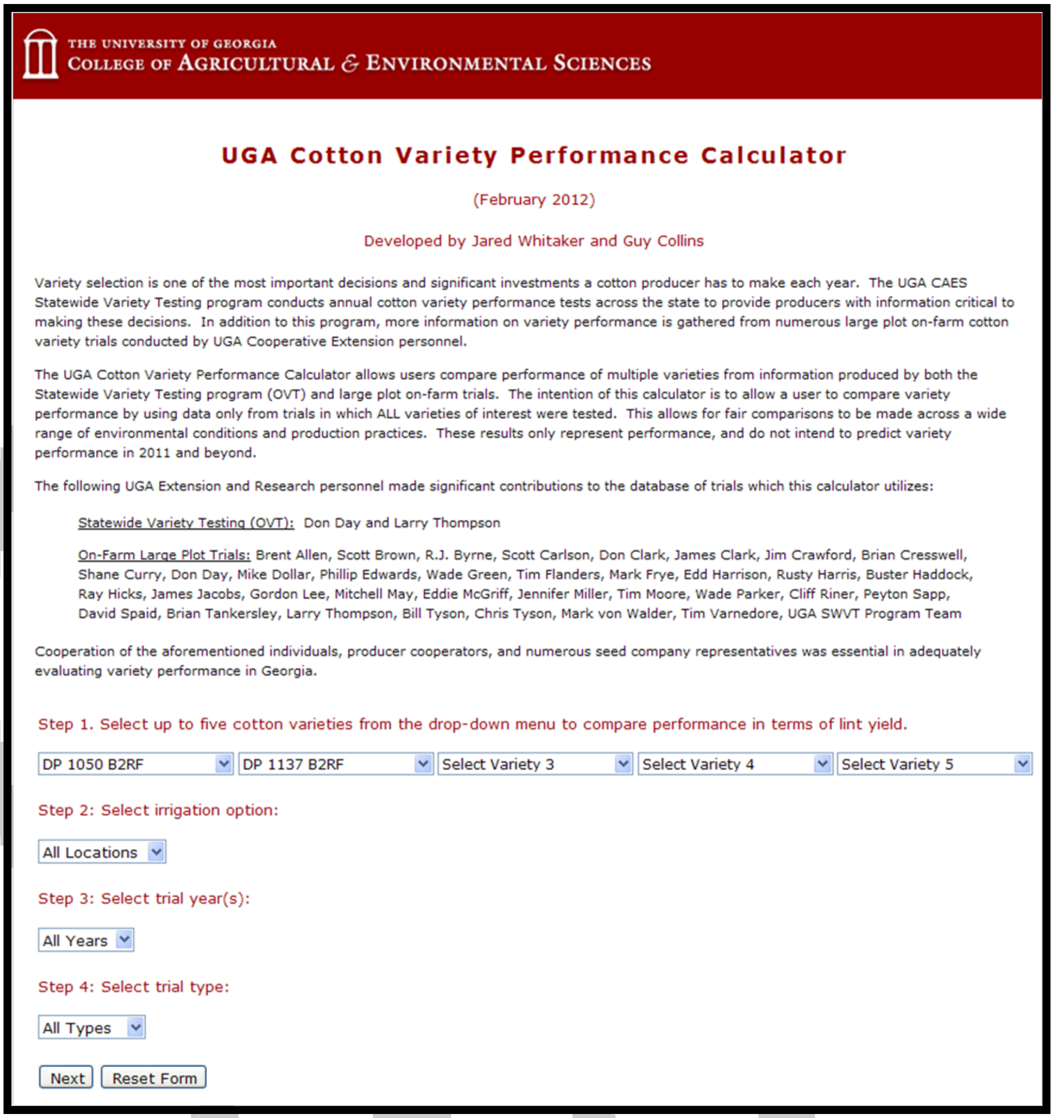
UGA Cotton Variety Performance Calculator (*Collins & Whitaker*)

Variety selection is one of the most important decisions and significant investments a cotton producer has to make each year. The UGA Cotton Variety Performance Calculator allows users compare performance of multiple varieties from information produced by both the Statewide Variety Testing program (OVT) and the UGA Uniform Cotton Variety Performance Evaluation Program (large plot on-farm trials). The calculator only represents past performance in UGA trials, and does not intend to predict variety performance in 2012 and beyond.

The UGA Cotton Variety Performance Calculator has been updated to include 2011 variety performance information. This calculator can be found on the UGA Cotton Webpage (www.ugacotton.com).

This calculator is designed provide simple, easy-to-access variety performance information from a database of cotton variety trials conducted by UGA extension and research personnel. This tool allows users to compare performance of up to five varieties and to choose certain criteria and specific trials from which to compile data and make variety comparisons.

One key aspect of this calculator is that when variety comparisons are made, yield data is only utilized from trials in which ALL selected varieties were tested. This ensures that variety comparison information is properly balanced and eliminates bias when a particular variety has been "tested" in more locations than another. A screen shot of the calculator is below:



THE UNIVERSITY OF GEORGIA
COLLEGE OF AGRICULTURAL & ENVIRONMENTAL SCIENCES

UGA Cotton Variety Performance Calculator

(February 2012)

Developed by Jared Whitaker and Guy Collins

Variety selection is one of the most important decisions and significant investments a cotton producer has to make each year. The UGA CAES Statewide Variety Testing program conducts annual cotton variety performance tests across the state to provide producers with information critical to making these decisions. In addition to this program, more information on variety performance is gathered from numerous large plot on-farm cotton variety trials conducted by UGA Cooperative Extension personnel.

The UGA Cotton Variety Performance Calculator allows users compare performance of multiple varieties from information produced by both the Statewide Variety Testing program (OVT) and large plot on-farm trials. The intention of this calculator is to allow a user to compare variety performance by using data only from trials in which ALL varieties of interest were tested. This allows for fair comparisons to be made across a wide range of environmental conditions and production practices. These results only represent performance, and do not intend to predict variety performance in 2011 and beyond.

The following UGA Extension and Research personnel made significant contributions to the database of trials which this calculator utilizes:

Statewide Variety Testing (OVT): Don Day and Larry Thompson

On-Farm Large Plot Trials: Brent Allen, Scott Brown, R.J. Byrne, Scott Carlson, Don Clark, James Clark, Jim Crawford, Brian Cresswell, Shane Curry, Don Day, Mike Dollar, Phillip Edwards, Wade Green, Tim Flanders, Mark Frye, Edd Harrison, Rusty Harris, Buster Haddock, Ray Hicks, James Jacobs, Gordon Lee, Mitchell May, Eddie McGriff, Jennifer Miller, Tim Moore, Wade Parker, Cliff Riner, Peyton Sapp, David Spaid, Brian Tankersley, Larry Thompson, Bill Tyson, Chris Tyson, Mark von Walder, Tim Varnedore, UGA SWVT Program Team

Cooperation of the aforementioned individuals, producer cooperators, and numerous seed company representatives was essential in adequately evaluating variety performance in Georgia.

Step 1. Select up to five cotton varieties from the drop-down menu to compare performance in terms of lint yield.

DP 1050 B2RF | DP 1137 B2RF | Select Variety 3 | Select Variety 4 | Select Variety 5

Step 2: Select irrigation option:

All Locations

Step 3: Select trial year(s):

All Years

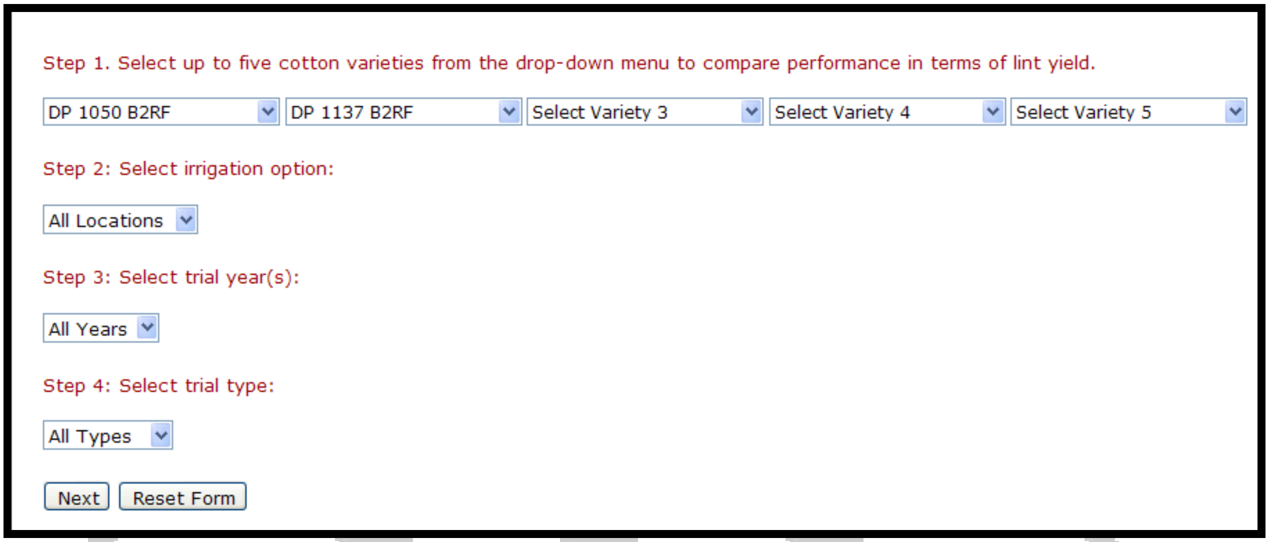
Step 4: Select trial type:

All Types

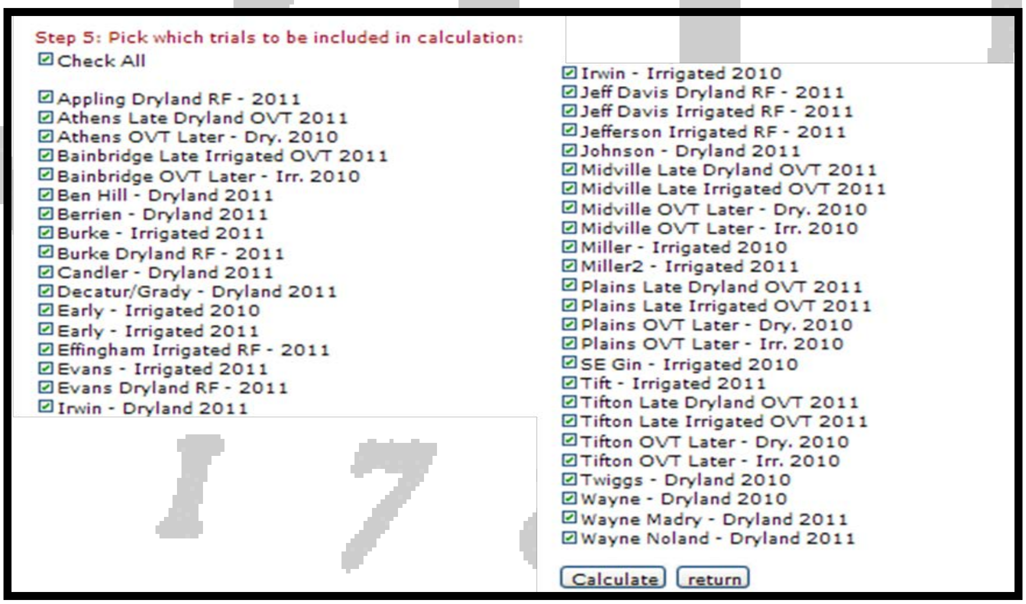
Next | Reset Form

To access information about particular cotton varieties, select varieties of interest in Step 1 (up to five varieties can be compared). Steps 2-4 allow for the user to "narrow" the scope of results by choosing to use data from irrigated trials, dryland trials, or both (Step 2), choosing which years to access data from (Step 3), and choosing to access UGA OVT small-plot trial data, large-plot on-farm data or both (Step 4). The default options for Steps 2 - 4 are to include all trials and options. To proceed, click the "Next" button.

As an example, varieties DP 1050 B2RF and DP 1137 B2RF have been chosen for comparison (Step 1) and information from all trials has been selected (default option for Steps 2 - 4). See screen shot below:



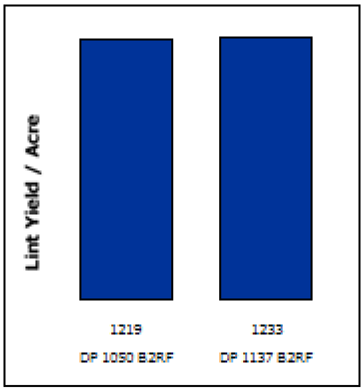
Once the "Next" button is clicked, the user is forwarded to Step 5 which allows select which trials are to be utilized to compile data. The default for Step 5 is to include all trials in which DP 1050 B2RF and DP 1137 B2RF were both tested. Below is a screen shot of Step 5:



Once Step 5 is completed and the "Calculate" button is clicked, a results page will appear. In this page, average lint yields from the selected varieties across all specified locations are presented. The total number of trials used for comparison are identified, which is further illustrated with the number of irrigated and dryland trials utilized. In this example, there were 42 total trials used to compare DP 1050 B2RF and DP 1137 B2RF, with 23 of those trials being irrigated locations and 19 trials being dryland locations. Below lint yield averages, are "yield stability" percentages. These percentages represent the percent yield of a particular variety compared to the average of all varieties tested in each of trials in which the selected variety was tested, not just comparison varieties. These percentages are based on 100% equaling the trial average. Percentages are provided for all trials, irrigated trials, and dryland trials. Below is a screenshot of this page.

UGA Cotton Variety Performance Calculator

In the lint yields below, data was combined ONLY from locations in which ALL variety selections were tested.



Number of trials Used for Comparision:	**42**
Number of Irrigated Trials:	23
Number of Dryland Trials:	19

Yield Stability of Selected Varieties
Represented as Percentage of Yield Compared to the Trial Average (100% equals trial average)
(number of trials tested in parentheses)

	DP 1050 B2RF	DP 1137 B2RF
All Trials	+106 (70)	+107 (42)
Irrigated	+106 (29)	+105 (23)
Dryland	+107 (41)	+108 (19)

The 2012 version of this calculator contains data from a total of 137 trials conducted since 2009, which includes 91 on-farm large-plot trials and 46 UGA OVT small-plot trials. In 2011, information from a total of 41 trials were added to the database. Of those 41, 25 were on-farm large-plot trials and 16 were UGA OVT small-plot trials. The wealth of information collected to compile this database is a testament to the dedication of the UGA County Agents and UGA Statewide Variety Testing team members. Their work along with cooperation and funding from the Georgia Cotton Commission and numerous cotton seed company representatives made this effort possible.

Fiber Quality of 2011 Georgia Cotton ***(Shurley)***

The quality of cotton lint or fiber is a function of many factors. Most notably, this includes cultivar/variety genetics, weather conditions during the growing season and harvest, defoliation and harvest timing, production practices and management, and ginning.

Over the past 2 growing seasons (2010 and 2011), Georgia cotton producers have made significant shifts in varieties planted. DP555BR once comprised over 80% of the acreage planted in the state. Since the elimination of 555 and all single-gene Bt technology, producers have transitioned to two-gene Bollgard II® (B2) and Widestrike® (W) varieties in 2010 and 2011.

2011 was characterized by severe drought during the planting season that resulted in poor emergence in non-irrigated production. Irrigated fields had to be irrigated numerous times to establish a good start. Non-irrigated fields were often replanted—many in June or even early July. Rainfall returned in July but August was again dry. Despite the dry conditions, cotton in some locations received timely rains that carried the crop through. Still other non-irrigated cotton was not as fortunate. Harvest conditions were generally favorable.

The following is a summary of the fiber quality of the 2011 crop and a comparison to 2009 and 2010. Georgia cotton was once maligned by some buyers and mills for its less than desirable fiber quality. Quality has improved significantly, however, despite sometimes less than desirable growing conditions—due perhaps to changes in varieties planted.

Summary of 2011

More so than other quality parameters, Color grade is dependent on defoliation and harvest timing and weather. It is much less a function of genetics. The "base grade" for Color is 41 but buyers and mills prefer 31 (a brighter cotton). For the 2011 crop, Color averaged mostly 41 but an almost equivalent amount of better grades 31 and 21 (Table 1).

Cotton is classed/graded and purchased on a "bundle" or combination of Color, Leaf, and Staple (fiber length). Leaf grade averaged just over 3 and Staple averaged 35.9 32^{nds} of an inch (or 1.122 inches). The base grade is 34 but mills may often prefer 35 or longer.

Table 1. Summary Profile of 2011 Georgia Cotton Quality[1]

	Color[2]		**Leaf**	**Staple**	**Strength**	**Micronaire**	**Uniformity**
	C1	C2					
Average	3.54	1.08	3.12	35.9	29.5	4.6	81.7

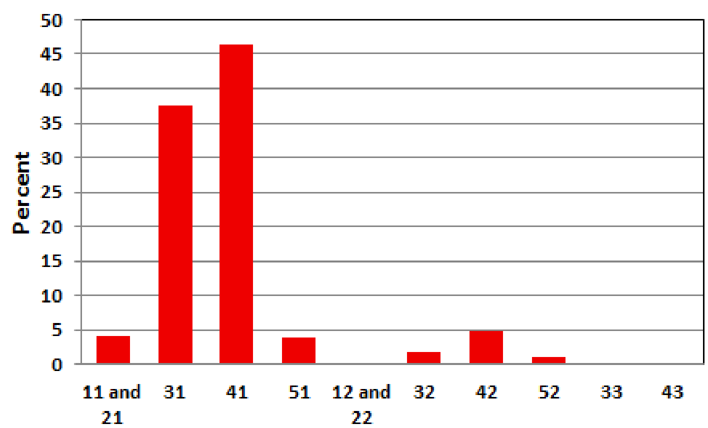
1/ SOURCE: USDA-AMS, Cotton Program. Based on 2.426 million "running bales" classed as of February 9, 2012. This is an estimated 2.525 million USDA "statistical bales" or 99% of the crop. The Georgia crop is estimated to total 2.55 million bales.
2/ C1 and C2 are the 2 numbers in the Color grade. If Color grade is 31, for example, C1 = 3 and C2 = 1.

Fiber strength averaged 29.5 grams per tex. The base grade range is 25.5 to 29.4. Micronaire is a measure of fiber thickness and maturity. Less than 3.5 is considered low and over 4.9 is considered high. The ideal or premium range is 3.7 to 4.2. The 2011 Georgia crop averaged 4.6. Uniformity is a measure of the consistency in fiber length. The base range is 79.5 to 82.4. The Georgia crop averaged 81.7.

Color Grade

Approximately 88 percent of the 2011 crop graded Color 41 or better (Figure 1). Almost 42 percent graded 31 or better. Color grade can be impacted by stink bug or other insect damage, weathering after bolls are open, and harvest timeliness. This can result in an increase in grades 32, 42, etc. Color grades less than the base grade of 41 (grades to the right of 41 in Figure 1) comprised only 12% of the 2011 crop.

Figure 1. Distribution of Color Grades, 2011 Georgia Cotton

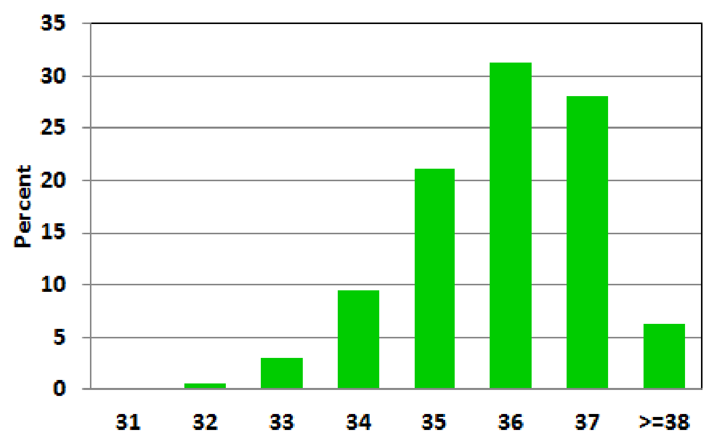


DATA SOURCE: USDA-AMS, Cotton Program

Staple

Mills often prefer cotton that is "long and strong". Staple is the average length (in 32nds of an inch) of the longest 50% of fibers in the sample graded. 34 32nds or 1 1/16 inch is the base grade. Shorter fiber is discounted by the buyer. Staple of the 2011 Georgia crop was very good (Figure 2). The average staple length was 35.9 and almost 87% of the crop graded 35 and longer and 65.5% graded 36 and longer. Drought can result in an increase in Staple less than 34. But even this tendency may be influenced by variety genetics. Despite drought conditions, less than 4% of the crop graded less than 34.

Figure 2. Distribution of Fiber Length (Staple), 2011 Georgia Cotton.

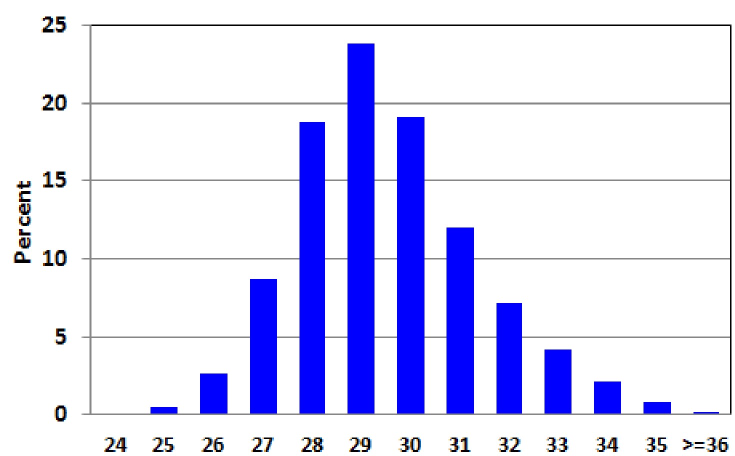


DATA SOURCE: USDA-AMS, Cotton Program

Strength

The base grade range for Strength is 25.5 to 29.4. The high-speed spinning process in mills requires strong fiber to reduce breakage and downtime. The 2011 Georgia crop had exceptional fiber strength. Strength averaged 29.5 with 45.6% of the crop grading 30

Figure 3. Distribution of Fiber Strength, 2011 Georgia Cotton.



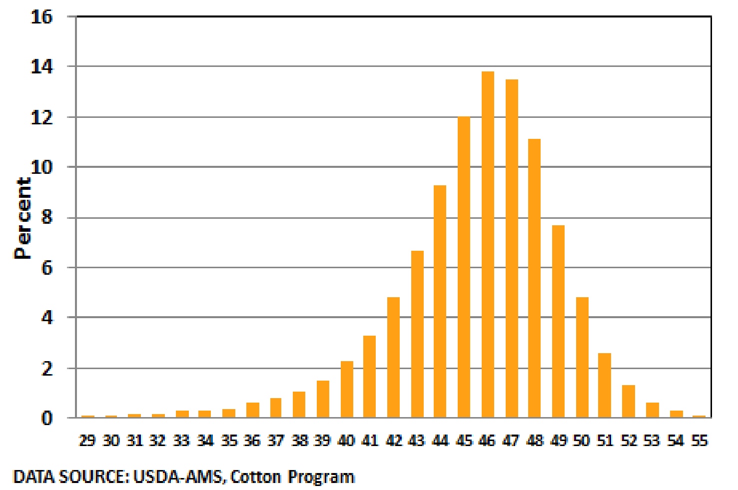
DATA SOURCE: USDA-AMS, Cotton Program

or higher (Figure 3). Over ¼ of the crop graded 31 or higher.

Micronaire

Micronaire or "mike" is related to the thickness of the fiber wall. Micronaire affects the dying characteristics of the fiber. Below 3.5 is considered low and above 4.9 is considered high. The ideal or premium range is considered to be 3.7 to 4.2.

Figure 4. Distribution of Micronaire, 2011 Georgia Cotton.

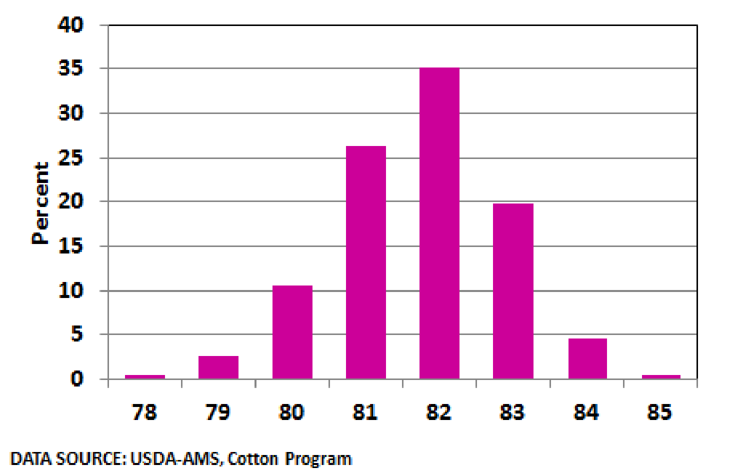


Many varieties tend to run on the high end of the acceptable range. Micronaire tends to be high (above 4.9) when prolonged drought occurs during fiber development. The 2011 Georgia crop averaged 4.6 and despite drought, only 9.7% of the crop was high-mike (Figure 4). High-mike may depend on when drought occurs, the extent of the drought, and the ability of the variety to tolerate drought conditions.

Uniformity

Fiber length Uniformity is considered a measure of the consistency in fiber length. Uniformity is the average length of all fibers in the sample divided by the Staple length. If average length is 29 and Staple is 35, Uniformity would be .829 or 83% (29 / 35 = .8286). Likewise, if Staple is 35 and Uniformity is 82, this means the average fiber length of the sample is 29 (35 x .82 = 28.7). The base grade for Uniformity is 79.5 to 82.4 (or rounded 80 to 82). Uniformity of the 2011 Georgia crop averaged 81.7 with 60% of the crop being 82 or higher (Figure 5). One-fourth of the crop (24.8%) was 83 or higher. Only 3.1% of the crop was low Uniformity (less than 79.5).

Figure 5. Distribution of Length Uniformity, 2011 Georgia Cotton.



Comparing 2011 to 2009 and 2010

The fiber quality of Georgia cotton has improved. This is likely due to the varieties now being planted. Despite weather and other challenges, quality parameters appear to be improving—suggesting that the improvement may be due to changes in varieties planted in 2010 and 2011.

Color grade is more a function of weather and defoliation and harvest timing rather than variety genetics. The most notable improvements in quality have been Staple and Uniformity (Table 2). Staple length increased from less than 35 in 2009 to almost 36 in 2011. In 2009, only 68.4% of the Georgia crop was Staple 35 and longer compared to 86.7% in 2011. Length Uniformity increased from 80.2 in 2009 to 81.7 in 2011. More notably, in 2011, 60% of the crop was Uniformity of 82 or higher compared to less than 14% in 2009.

Table 2. Fiber Quality Comparison of 2011 to 2009 and 2010

	2009	**2010**	**2011**
% Bales Color 31 and Better	20.8	50.1	41.6
Average Staple	34.8	34.9	35.9
% Bales Staple 35 and Longer	68.4	62.2	86.7
Average Strength	28.4	29.8	29.5
% Bales Strength 30 and Higher	20.1	54.9	45.6
Average Uniformity	80.2	81.0	81.7
% Bales Uniformity 82 and Higher	13.4	40.8	60.0

SOURCE: USDA-AMS, Cotton Program

<u>Valor for Cotton Burndown</u> (*Culpepper*)

Valor for cotton burndown has become the most common "tool" used by growers in an effort of reducing or eliminating Palmer amaranth being present at the time of planting. Since this herbicide has become such an important tool, let's review the most effective application methods to obtain maximum Palmer control while minimizing crop injury.

<u>Option 1:</u>
First: apply Valor at 2 oz/A,
Second: wait 7 or more days,
Third: implement strip tillage operation followed immediately by planting and preemergence herbicides.

<u>Option 2:</u>
First: run your strip till operation,
Second: apply Valor at 2 oz/A,
Third: wait ≥30 days (less than 30% plant residue) or ≥21 days (more than 30% plant residue) plus one inch of rain,
Fourth: plant into the previously run strip followed immediately with preemergence herbicides.

<u>Option 3:</u>
First: apply Valor at 3 oz/A,
Second: wait 60 days or more (a label is being developed to reduce this time interval, contact your local extension agent for the latest),
Third: implement strip tillage operation followed immediately by planting and preemergence herbicides.

Significant rains, water erosion, wind erosion, lack of activating rainfall, or any type of tillage will reduce control by Valor. DON'T FORGET TO CLEAN YOUR SPRAY TANK!!!!!

Should I Apply Reflex Preplant Incorporated (PPI), Preemergence (PRE), or Split My Reflex Into Both PPI and PRE Applications? (***Culpepper***)

Over the past two years, we have been sharing information on a new label allowing Georgia growers to incorporate Reflex. Let's discuss the pro's and con's of these system.

Option 1: Reflex applied PRE behind the planter press wheel.

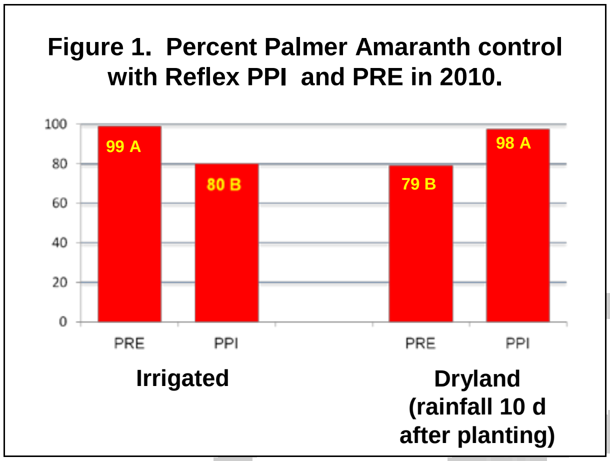
1. When activated by rainfall/irrigation, Reflex PRE is more effective than PPI (Figure 1).
2. When not activated by rainfall/irrigation, Reflex will not control emerging pigweeds; however, Reflex will lay on the soil surface for weeks and once the herbicide is activated it will provide very good control of those Palmer amaranth plants germinating at that point.
3. The likelihood of injury from PRE applications is greater than PPI applications.

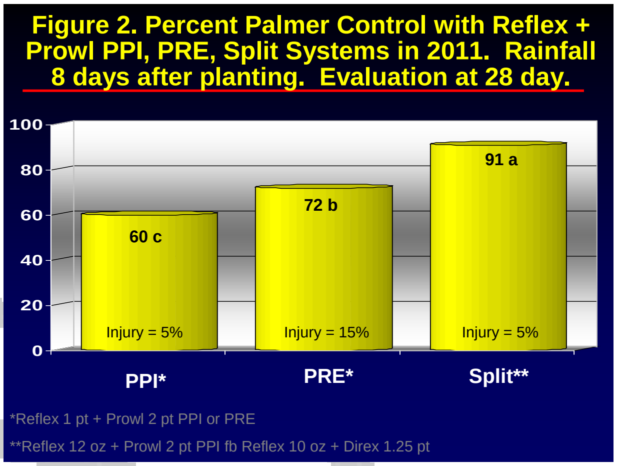
Option 2: Reflex PPI prior to planting.

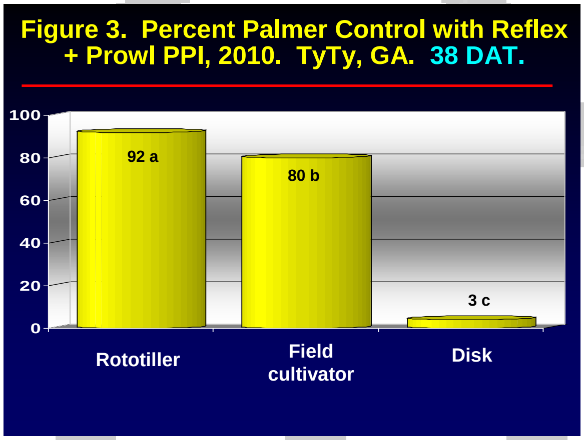
1. If moisture is present in the soil at time of incorporation, no activating rainfall required.
2. When no timely activation by rainfall/irrigation occurs, Reflex PPI is more effective than PRE (Figure 1).
3. Uniform PPI applications reduce injury potential by at least 50% compared to the PRE.
4. Incorporate Reflex ONLY in the top 1 to 1.5 inches of the soil profile. Growers who incorporate Reflex deeper than 1.5 inches are wasting money (Figure 3).
5. Incorporate Reflex within one week of planting as this herbicide is needed for in-season weed control rather than pre-season weed control. For growers seeking pre-season control, other options exist and should be used. It is critical that Reflex be used in a method of providing Palmer amaranth control during the first few weeks after planting.

Option 3: Reflex PPI followed by PRE application.

1. A split program (such as Reflex at 12 oz/A + Prowl/Treflan PPI followed by Reflex at 8 to 12 oz/A + diuron PRE) would achieve the highest level of early-season control across environments (Figure 2).
2. Injury from the split system will be most closely related to the amount of Reflex applied PRE assuming the PPI portion is uniformly incorporated throughout the top 1.5 inches of the soil.
3. Incorporate Reflex ONLY in the top 1 to 1.5 inches of the soil profile. Growers who incorporate Reflex deeper than 1.5 inches are wasting money (Figure 3).
4. Incorporate Reflex within one week of planting as this herbicide is needed for in-season weed control rather than pre-season weed control. For growers seeking pre-season control, other options exist and should be used. It is critical that Reflex be used in a method of providing Palmer amaranth control during the first few weeks after planting.







<u>Palmer Continues to Amaze !!!</u> (*Culpepper and Sosnoskie*)

There is no secret that understanding the biology of Palmer amaranth is critical for successful management. During 2010, a dryland experiment was conducted to determine the length of time required for an emerging Palmer amaranth plant to reach a height of 3 and 6 inches. Results below show the influence of time of year on Palmer growth. Results also note how quickly Palmer "out grows" our ability to effectively control the plant with a postemergence herbicide.

Time of emergence	Number of days to reach 3 inch	Number of days to reach 6 inch
April 1	14	21
April 15	16	19
May 1	16	19
May 15	8	11
June 1	7	12

Timely Management for Diseases and Nematodes in 2012 ***(Kemerait)***

The unusually warm and dry weather from the winter of 2011-2012 was largely attributable to a La Niña ENSO phase where surface temperatures in the Pacific Ocean affected conditions in the southeastern United States. Cotton growers may continue to see lingering effects from last winter early in the growing season; effects that could be both helpful and harmful to the cotton crop.

Warm soil temperatures at planting, especially when coupled with adequate soil moisture, will foster rapid seed germination and vigorous growth. Rapid germination and vigorous growth allows the seedlings to become established quickly and to outgrow severe damage from seedling diseases. At the very least, planting into warm soil temperatures significantly reduces the risk to losses from seedling diseases. Where a grower practices good crop rotation and plants high quality, high vigor seed, warm soil temperatures also reduce the need for additional fungicide seed treatments. Based upon research data, additional fungicides like Dynasty CST and Trilex do provide measurable protection to the cotton seedlings; however this "insurance" is less important when growing conditions at planting are favorable for rapid germination and vigorous growth.

While warm soil temperatures may reduce the threat to seedling diseases, these same temperatures may actually increase the threat from plant-parasitic nematodes to the cotton crop. Root-knot, reniform, and Columbia lance nematodes are typically inactive during the winter months in response to cold soil temperatures. However, when soil temperatures remain warmer for longer periods of time, as they did in 2012, some nematodes may continue to reproduce on hosts like wheat and suitable winter weeds, thus continuing to build populations for the next season. Additionally, should soil temperatures warm earlier in the spring prior to planting, it is likely that the nematode populations in the soil may be active and "waiting" for the new cotton crop.

Protecting the cotton crop from significant damage by plant-parasitic nematodes early in the season is critical; the goal is to allow the young tap root and secondary roots to become well-established before the inevitable damage from the nematodes occurs. In fields infested with the **southern root-knot nematode**, Phytogen 367WRF, Stoneville 4288B2RF and Stoneville 5458BRF all provide proven resistance to that particular nematode. While none of these three varieties is completely resistant to the southern root-knot nematode, they do suffer less damage and allow smaller increases in nematode populations than do susceptible varieties. (Note: though the resistant varieties have reduced damage from the root-knot nematodes, this does not necessarily mean that they will always out-yield other varieties protected with nematicides, especially in fields with low-to-moderate populations of root-knot nematodes.) Further steps to reducing damage from nematodes affecting cotton include rotating a field with peanuts, use of the fumigant Telone II, and treating seed with nematicides like AVICTA, AERIS seed-applied system, and Accelron N where nematode populations are considered to be at a low-to-moderate threshold level (contact your county agent for additional information on threshold levels). Although the response to Vydate CLV for management of nematodes affecting cotton in Georgia is variable, this product can be used in conjunction with a seed-treatment nematicide in an effort to reduce damage from nematodes.

Corynespora leaf spot will likely be a considerable problem for some growers in 2012, especially if we have more rainfall this season than we did last season. Growers at greatest risk to Corynespora leaf spot (and those most likely to benefit from the use of a fungicide sometime after first bloom) include those where:

1. Cotton is planted in short rotation (or where cotton is planted behind cotton).
2. The cotton in a field has thick/rank foliar growth that traps humidity or delays drying of the lower leaves from dew from the previous night.
3. Cotton is planted in a field where Corynespora leaf spot has been a significant problem in the past.
4. Although the problem is certainly not limited to southwestern Georgia, the growers in that area are most at-risk to Corynespora leaf spot.
5. Fields affected by tropical storms (if such occurs in 2012) will also be at increased risk to this disease.

Contributions by:

Guy Collins, Extension Cotton Agronomist
Jared Whitaker, Extension Agronomist
Don Shurley, Extension Economist
Stanley Culpepper, Extension Weed Scientist
Lynn Sosnoskie, Extension Weed Scientist post-doc
Bob Kemerait, Extension Pathologist

Your local County Extension Agent is a source of more information on these subjects.

Edited by: Guy Collins, Extension Cotton Agronomist