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

Georgia Cotton

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Cotton Growth Management in 2010

The transition away from DP 555 BR has contributed to most likely one of the most diverse cotton crops Georgia has seen in several years, from a variety perspective. Now that the majority of this year's crop is off and growing, the first applications of plant growth regulators (PGR's) will soon follow. One of the most consistent characteristics of DP 555 BR is its vigorous vegetative growth and its ability to recover from dry spells and produce fruit later in the season. Research has shown that many of the new varieties have yield potentials which are equal to or greater than that of DP 555 BR, especially in irrigated environments. However, limited experience with some of these varieties in 2009 leads us to think that some of these varieties are somewhat earlier maturing than DP 555 BR, and tend to set more fruit lower in the plant canopy and retain these earlier-set fruit to a greater extent than DP 555 BR (Figure 1). Coupled with, or resulting from this tendency, many new varieties have shorter final plant heights and fewer main-stem nodes when grown under similar PGR regimes (Table 1).

These observations indicate that some of the newer varieties may require less aggressive plant growth management. However, this does not mean that PGR applications are not needed, but that careful attention should be paid to vegetative growth or vigor and fruiting characteristics on a case-by-case basis when making these decisions. This is especially important when making early season PGR applications to newer varieties or in dryland environments. Utilizing lower PGR rates for applications made at early growth stages may reduce the risks of stunting growth and reducing yield potential. Extensive research is being conducted in 2010 which will hopefully shed more light on this issue. However, we have found that some of the newer varieties, especially the later maturing ones, can grow as aggressively as DP 555 BR in the very

wet environments that were observed in 2009. Therefore, PGR decisions should be made on an individual field basis, and not on a broad or generalized basis.

When making these decisions, it is important to remember what PGR applications actually do. Mepiquat-containing PGR's suppress vegetative growth by reducing plant height and the total number of mains-tem nodes, and shortening internode distances. The use of these products can also cause a shift in boll distribution, creating a more concentrated or compact fruiting zone, often on lower nodes of the plant. The improved retention of these earlier-set bolls often results in a heavier boll load which can also limit the photosynthetic resources available for further vegetative growth. Nevertheless, each decision should be made only after considering numerous factors including field history, variety, irrigation capability, timing of nitrogen applications, fruit load, etc.

Figure 1. First position boll production of five cotton varieties per main-stem node. Data averaged across five locations in Georgia during 2009.

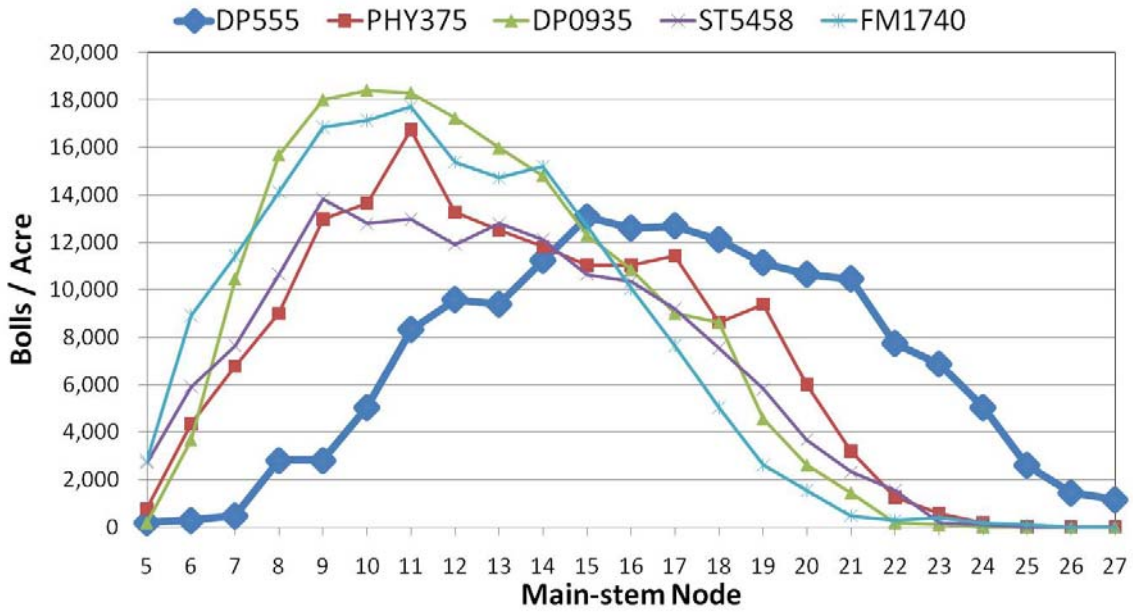

Table 1. Final plant height and number of main-stem nodes of five cotton varieties. Data averaged across five locations in Georgia in 2009.

Variety	Height	Total Main-stem nodes
DP 555 BR	46	26
PHY 375 WRF	42	22
DP 0935 B2RF	41	23
ST 5458 B2RF	40	22
FM 1740 B2RF	38	21

Controlling Emerged Glyphosate-Resistant Palmer amaranth in Emerging Roundup Ready Cotton

Numerous calls have suggested that many growers are dealing with emerging glyphsoate-resistant Palmer amaranth in emerging Roundup Ready cotton. In situations where directed herbicide applications are not feasible, topical applications are ultimately limited primarily to Staple and Cotoran. Staple can be applied topically to cotton from cotyledonary stage up to 60 days of harvest and will control non-ALS resistant Palmer amaranth that is up to 2 inches in height. Cotoran is also an option and can be applied overtop of 3- to 6-inch cotton, albeit this option is certain to cause significant cotton injury often including maturity delay and yield loss. Activity of both Staple (non-ALS resistant populations) and Cotoran depend on Palmer size with acceptable control often achieved only when plants are 2 inches or less in height. Larger plants are often not controlled effectively (Table 1); HOWEVER, these herbicides may *provide a height differential* even on these larger plants which will be needed for a follow up directed herbicide application in an effort to salvage the crop.

MSMA is also an herbicide that could be applied overtop of 3- to 6-inch tall cotton. Numerous MSMA labels still exist with this use pattern. Unfortunately, this specific use of MSMA will likely be removed from labels in the near future in an effort to sustain our ability to use MSMA as a directed application.

Table 1. **Five inch** Palmer amaranth response to Staple, Cotoran, and MSMA mixtures.*

Herbicide Option	Percent Palmer control 10 d after treatment	Percent cotton injury 19 d after treatment
MSMA + NIS	51 c	18 b
Staple + NIS	57 c	3 c
Cotoran + NIS	46 c	18 b
Cotoran + MSMA + NIS	74 b	23 a
Cotoran + Staple + MSMA + NIS	83 a	25 a
*MSMA 6 L, 1.5 pt/A; Staple LX, 2.6 fl oz/A; Cotoran, 2 pt/A; NIS = non ionic surfactant, 0.25% v/v. Values followed by the same letter do not differ at P = 0.05.		

Layby Directed Herbicide Options for the Control of Glyphosate-Resistant Palmer amaranth

Regardless of cotton technology being grown, the most consistently effective options for the control of emerged Palmer amaranth include diuron (Direx, others) plus MSMA plus crop oil or Layby Pro plus MSMA plus crop oil. Diuron will likely provide a greater level of residual control when compared to Layby Pro. Cotton should be at least 12 inches in height prior to applying the diuron mixture and at least 16 inches in height before applying the Layby Pro mixture. With both of these herbicide applications, growers should target Palmer amaranth 3 inches in height or smaller. Valor plus MSMA is also a good option if Palmer amaranth is less than 2 inches in height. Valor offers the greatest level of residual control of any layby directed herbicide option assuming activation by rainfall or irrigation.

Thrips

Thrips infestations have been near normal or below depending on location. April and early May plantings had moderate to high infestations and numbers have since tapered off. This is a pattern which we see in most years. Each year we establish insecticide screening trials to evaluate at-plant and foliar insecticides for thrips. This year we planted a trial on April 28 to increase the likelihood of having heavy pressure. Thrips counts exceeded 20 immatures per plant in some plots; however plant damage is not as severe as we would have expected. Heat unit (DD 60s) accumulation has been higher in 2010 compared with previous years and seedling growth has been rapid. Rapid seedling growth helps plants tolerate thrips feeding and damage. Slow growth due to cool temperatures or other plant stresses increases the susceptibility of seedlings to thrips.

Degree days data and other weather information can be found at http://georgiaweather.net.

Coastal Plain Experiment Station
The University of Georgia
Tifton, Tift County, Georgia

Degree Day Calculator

From month? May and Day: 1 2010
To - May - 25 2010
Base temperature 60 °F
Disregard temperatures above none °F
Calculate

May-1	May-25	Total
2010	2010	394
2009	2009	324
2008	2008	314
2007	2007	317

60<=Temp<=none °F

Data requested on Wednesday May 26 2010 at 7:20:14 AM.
For Automated Environmental Monitoring Network information
or for comments or suggestions, please contact Gerrit Hoogenboom

Cotton seedlings are susceptible to thrips until plants reach the 4-5 leaf stage and are growing rapidly. Seedlings are most sensitive to damage during early stages of development. Similar thrips infestations and injury will likely result in greater yield loss on 1-2 leaf cotton compared with 3-4 leaf cotton. The threshold for thrips on seedling cotton is *"Apply when 2-3 thrips per plant are counted and immatures are present. Treatment is rarely necessary after plants have 4-*

5 true leaves and are growing vigorously". The presence of immature (wingless and crème colored) thrips suggest that the at-plant insecticide is no longer providing control. Unneeded foliar insecticide applications for thrips should be avoided. Potentially early season sprays could increase the likelihood of flaring aphids or spider mites.

Grasshoppers

We have received a few reports of grasshoppers. Grasshopper problems are sporadic, isolated, and almost always associated with reduced tillage fields. Grasshoppers also appear to be more problematic on lighter soils, often occurring on the same farm from year to year. Grasshopper damage is unpredictable, but can potentially threaten a stand. Grasshoppers may feed on foliage, but most economic damage occurs when grasshoppers feed on the main stem of emerging (in the crook stage, cracking) or small seedlings. Be sure to scout fields infested with grasshoppers as cotton begins to emerge. In some situations grasshoppers may completely sever the stem, but more often they will chew partially through the stem weakening the plant which often will fall over at the wound site. Grasshoppers overwinter in egg cases which were deposited in the soil; thus we typically see more problems in reduced tillage systems. In fields infested with grasshoppers, be sure to walk the entire field looking for emerging grasshoppers in the inner portions of the field away from the edges. If infestations are only observed on the field edges, potentially grasshoppers are migrating from other areas and infield border sprays may suffice. Immature or wingless grasshoppers are very susceptible to insecticides; however adults can be more difficult to control and high rates of insecticides labeled for grasshoppers should be used. In fields with historical problems with grasshoppers, Dimilin has proven to be a good management tool for grasshoppers. Dimilin is an insect growth regulator with extended residual that provides good control of immature grasshoppers. Dimilin will NOT control adult grasshoppers. Unfortunately we do not have thresholds for grasshoppers in cotton. Preventive insecticide applications are a judgment call. As cotton emerges treatment decisions should be based on seedling damage.

Complications With Seedling Disease in the 2010 Season

Seedling diseases, typically caused by the fungal pathogen *Rhizoctonia solani*, occur in nearly every cotton field in Georgia. Depending on factors such as crop rotation, environmental conditions and soil temperature at planting time, and use of fungicides, the severity of seedling disease may be more severe or less severe.

Reports of and complaints about seedling diseases have been more common in 2010 than in recent years. From samples sent to the diagnostic lab in Tifton and from my visits to commercial fields, I do not believe that soreshin, far and away the most important seedling disease, is any worse statewide than it has been in recent years. "Soreshin" is characterized by dark, sunken lesions that develop just below the soil surface. In severe cases the lesions will completely girdle the succulent young stem and kill the seedling. In less severe cases the lesion may not kill the seedling. In such instances, the seedling may "repair" the lesion and develop into a quite productive cotton plant. In other cases the damage may not be severe enough to kill the seedling

but will be severe enough to reduce the vigor and growth of the cotton throughout the growing season.

Picture from Mark Crosby, 2010 Emanuel County

It is my perception that one of the most important reasons for increased awareness of the effects of seedling diseases in 2010 has a lot to do with the current re-plant policies offered by major seed companies. These policies have increased the possibility of replanting a cotton field by reducing the costs associated with the seed to be replanted. Where in the past a grower might have decided against replanting because of seed costs, the same grower today might choose to optimize stand by planting again.

My intent here is not to give an absolute recommendation on when to replant or not to replant; however I would like to offer some considerations to the growers. They are as follows.

1. **Assess the current damage in the field and try to assess what, if any, damage will occur to the current stand in the future.** Current damage is assessed by dead and dying plants. Severe stand loss in patches will likely have a greater impact on yield than will minor losses spread across the field. Future damage can be assessed by walking fields, especially during periods of stress, to determine how well the rest of the field is growing. If the crop is under stress, but the plants continue to look healthy and vigorous, they will likely overcome any lingering effects of sub-lethal infection. Plants that show

wilt symptoms when other plants remain vigorous may continue to be affected by the early season injury for much of the season.

2. **Recognize that there are risks to re-planting the cotton**. For example, the same pathogens that attacked the first planting will be "awake" and ready the second time around as well. While seedling disease is often most severe in cooler and wetter soils, *Rhizoctonia solani* also thrives in warm soils as well. Growers who choose to replant should also consider using additional fungicide seed treatments or in-furrow fungicides at the time of planting. An additional risk, especially for cotton grown in non-irrigated fields, is that weather conditions at the time of a second planting may be less favorable for the rapid emergence and vigorous growth than were the conditions the first time. The trade-off between the potential for an improved stand and the potential for poorer growing conditions may, in the final analysis, may tilt away from replanting.

Current replant policies offered by major seed companies offer growers additional insurance to protect their investment in their cotton crop. It is reassuring to know that where a grower needs to replant, the costs associated with such are often lower than they have been in the past. However, growers and consultants should recognize that lower costs to replant are simply an additional variable to factor into the final replant equation.

Foliar Diseases in 2010

In 2009, much of the cotton crop across the state was affected by three leaf spot diseases. These included Stemphylium leaf spot, Cercospora leaf spot, and Corynespora leaf spot. Growers can do much to reduce the potential for severe outbreaks of Stemphylium and Cercospora leaf spots by managing potassium fertility carefully during the season. Insufficient potassium is the critical factor affecting severe outbreaks of these diseases. Corynespora leaf spot was particularly troublesome in 2009 and does not appear to be as closely related to soil fertility as are the other two diseases. While we do not currently have exact recommendations for the management of Corynespora leaf spot, we encourage growers to scout their fields carefully as the crop approaches first bloom. Where this disease is already established by early reproductive growth or where it was a severe problem in 2009, growers may want to treat portions of their field with a fungicide like Headline or Quadris to determine if such an application provides beneficial control. Also, BASF will market "Twinline" on a limited basis cotton growers in 2010. Twinline is a pre-mix of pyraclostrobin (Headline) and metconazole (Caramba).

Cercospora leaf spot; Dr. Glen Harris trial, Sunbelt Expo.

Cotton Scout Schools: Tifton June 14, Midville June 22, 2010: Cotton insect scouting schools are annually held at various locations in Georgia. These programs offer general information on cotton insects and scouting procedures and will serve as a review for experienced scouts and producers and as an introduction to cotton insect monitoring for new scouts. The annual Cotton Scout School in Tifton will be held on June 14, 2010 at the UGA Tifton Campus Conference Center. The Midville Cotton Scout School will be will be held on June 22, 2010 at the Southeast Georgia Research and Education Center. The training programs at each location will begin at 9:00 a.m. and conclude at 12:30 p.m.

Stripling Irrigation Research Park Field Day: UGA's Stripling Irrigation Research Park, located near Camilla, will hold its annual Field Day on June 29. Registration begins at 8:30am. There will be a field tour of research and extension projects beginning at 9am. At 10am, there will be a presentation by Richard Royal, chair of the Lower Flint-Ochlockonee Water Planning Council, as well as UGA College of Ag & Environmental Sciences administrators. At 11am, a second research and extension project field tour will begin. Crops involved in irrigation research at Stripling Park include cotton, corn, peanut, soybean, sweet corn, tomatoes, and peppers. A free lunch will be provided beginning at 12 noon. Pre-registration is free and encouraged to help with meal planning. Contact Heather Hunter at Stripling Park at sirp@uga.edu or 229.522.3623.

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

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