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

Georgia Cotton

April 5, 2009 www.ugacotton.com

Occasional and Sporadic Insect Pests of Seedling Cotton (*Roberts*). Thrips are our most predictable insect pests of seedling cotton. Due to the predictability of thrips infestations, most growers utilize a preventive systemic insecticide at planting for thrips control. Use of a recommended systemic insecticide at planting has provided a consistent positive yield response in UGA trials. However, growers must also be aware that there are additional seedling pests such as grasshoppers and cutworms which may threaten stand establishment and negatively impact yield potential.

Cutworms are sporadic pests of seedling cotton in Georgia. Infestations are most often observed in reduced tillage fields, especially when burn-down herbicides are not applied in a timely manner. To reduce the risk of cutworm problems, winter weeds and/or cover crops should be killed at least 3 weeks prior to planting. No green vegetation should be present in the field at planting. Cutworms infesting green plants present in the field at planting will likely move to emerging cotton. The risk of cutworm problems is greatest when a legume cover crop is used > winter weeds > small grains. Cutworm infestations are often spotty or localized in fields where winter weeds are present. This observation is most likely associated with differing winter weed fauna in the field as cutworms likely prefer and infest certain weed hosts. In high risk fields, i.e. planted into a legume cover crop which was not burned down in a timely manner, growers should consider applying a labeled pyrethroid at planting for cutworm control. Be sure to scout all fields, especially high risk fields for cutworms.

Grasshoppers are also sporadic pests, but tend to be problematic in some fields on a more regular basis. Grasshopper infestations are most often observed in reduced tillage fields. Grasshoppers overwinter as eggs in the soil and tillage operations likely reduce survival. Grasshopper infestations tend to be more common following dry winters. Growers should be observant for grasshopper activity when applying burn-down herbicides and at planting. Immature or wingless grasshoppers can be effectively controlled with several insecticides; however winged or adult grasshoppers can be difficult to control. Emergence of immature grasshoppers from egg cases in

the soil occurs for several weeks and thus a single application may not provide acceptable control. Dimilin, an insect growth regulator, provides good control of immature grasshoppers and offers longer residual control of immature grasshoppers compared with contact insecticides such as pyrethroids. Dimilin will not control adult grasshoppers.

2009 US and Georgia Cotton Acreage *(Shurley and Smith).* On March 31, USDA released its annual *Prospective Planting* report. This is the results of a March survey of farmers to determine what they intend to plant. The first estimate of actual acreage planted will be released on June 30. Actual acreage decisions will depend on weather, soil conditions, crop prices, costs, and other factors.

Georgia acreage is expected to remain the same as last season at 940,000 acres planted. Georgia is one of only 5 states that are expected not to reduce acreage further in 2009. Of those 5 states, 3 are in the Southeast.

2009 Cotton Planting Intentions Compared to 2007 and 2008

	2007 Actual [1]	2008 Actual [1]	2009 Intentions [1,2]	Change From 2008
Alabama	400.0	290.0	280.0	-3.4%
Florida	85.0	67.0	65.0	-3.0%
Georgia	1,030.0	940.0	940.0	0.0%
North Carolina	500.0	430.0	375.0	-12.8%
South Carolina	180.0	135.0	140.0	+3.7%
Virginia	60.0	61.0	65.0	+6.6%
SOUTHEAST	**2,255.0**	**1,923.0**	**1,865.0**	**-3.0%**
Arkansas	860.0	620.0	520.0	-16.1%
Louisiana	335.0	300.0	240.0	-20.0%
Mississippi	660.0	365.0	300.0	-17.8%
Missouri	380.0	306.0	300.0	-2.0%
Tennessee	515.0	285.0	310.0	+8.8%
MIDSOUTH	**2,750.0**	**1,876.0**	**1,670.0**	**-11.0%**
Kansas	47.0	35.0	35.0	0.0%
Oklahoma	175.0	170.0	160.0	-5.9%
Texas	4,925.0	5,015.5	4,720.0	-5.9%
SOUTHWEST	**5,147.0**	**5,220.5**	**4,915.0**	**-5.9%**
Arizona	172.5	135.8	131.0	-3.5%
California	455.0	275.0	195.0	-29.1%
New Mexico	47.7	39.7	35.5	-10.6%
WEST	**675.2**	**450.5**	**361.5**	**-19.8%**
TOTAL US	**10,827.2**	**9,470.0**	**8,811.5**	**-7.0%**

SOURCE: USDA-NASS

1/ Thousand acres

2/ USDA *Prospective Planting*, March 31, 2009.

US acreage is expected to be down 7% from last year. Farmers say they intend to plant 8.81 million acres—down another 658,000 acres from 2008, over 2 million acres less than 2007, and almost 6 ½ million acres less than back in 2006. The intended acreage of 8.81 million acres is actually higher, however, than most pre-report expectations. Pre-report estimates ranged mostly from 8.1 to 8.5 million acres.

In terms of possible impacts on prices and the market, new crop (December 2009 futures) prices are currently around 51 cents per pound and have actually increased somewhat since the report. This seems to be due to yet unsubstantiated rumors of improving export sales. In the longer term, this higher than expected acreage, if verified by the June report, may cause weaker prices unless the demand side does indeed get a shot in the arm.

When prices are low and a POP/LDP is likely, cotton producers know 55 to 60 cents total money is going to be in play one way or the other. Unless the market rallies beyond this point, there is little incentive to do anything in terms of selling the crop. So, keep an eye out for possible rallies this spring and summer and, in the meantime, just put your efforts into making the best yield and fiber quality at the lowest price per pound possible.

Fertilizer Prices, Starter Fertilizer, Potash and Additives (*Harris*). Fertilizer prices continue to inch down, which is good news for cotton growers. Many growers are holding out until the last possible minute to book their cotton fertilizer in hopes that it will come down even more by planting time. Currently in Tifton, as of April 1 (and this is no April fools joke), urea and liquid nitrogen price out to somewhere around 45 cents per pound of N. The P in DAP is around 25 cents per pound. The K in muriate of potash, while still relatively high, is around 67 cents per pound of K. 10-34-0 is also still relatively high but has come down from around $1000 per ton to somewhere around $800 per ton.

The fact that 10-34-0 and potash have remained relatively high in cost has generated a lot of interest in possibly cutting back on these inputs. The 10-34-0 question is difficult to answer since it depends not only on your soil test P levels, but how cold and wet the soil is going to be right after you plant. Once the soil warms significantly, for example for mid-to-late May-planted conventional-till cotton, broadcasted DAP may do just as good as using 10-34-0. In addition, most studies show that even though you get better early-season plant growth when using starter fertilizers, this rarely translates into more yield.

The potash question is easier to answer. Look at the rate of potash that UGA recommends based on soil sampling and apply it all at planting. Simple as that. Yes, it is a fairly costly input, but it should pay for itself. In fact, without it you could actually reduce yields and really kill your chance of any profitability. Also, even if you apply the potash in a band, use the recommended rate. A lot of people think that if you band P and K you can reduce the rate, which is simply not true as long as your soil test levels of P and K are medium or higher.

Then there are the additives. It should come as no surprise that as the cost of fertilizer increased over the last three or four years there has been a plethora of new materials claiming you can add them to fertilizers to make them work better. The biggest concern I have here is that many of

these products have still not been adequately field tested on cotton in the southeast. Agrotain, which is a urease inhibitor, is one of the only products that has been tested for more than two years and shown positive results in cotton. Even then, Agrotain is not recommended in every situation. For example, if you can soil incorporate urea fertilizer or rain or irrigate it in with more than ½ of water, the need for Agrotain goes down. On the other hand, sidedressing granular urea on strip-till, dryland cotton with no chance of rain for a week is a great place to recommend Agrotain. AVAIL, a co-polymer designed to add to DAP or 10-34-0 on order to delay the tie-up of fertilizer P in the soil thus making it more available for plant uptake, shows promise, especially in soils that test low in P. CALFA, which is a carboxylic acid also designed to add to DAP or 10-34-0 was tested for the first time on cotton last year and also shows promise. Stay tuned for more information on these and other fertilizer additives as more data comes in and we learn where and when and how they can improve fertilizer use efficiency.

A Single Shot at Nematodes and Seedling Diseases (*Kemerait*). If managing nematodes and seedling diseases was analogous to hunting and cotton farmers were hunters, then they would carry single-shot rifles with a lot resting on the one bullet. Depending on the target, a hunter may choose one caliber over another; however the wrong choice of ammunition, or a poorly placed shot, leaves little opportunity for a second chance.

When the target is nematodes, the most effective options are spent once the furrow is closed. Fumigation with Telone II, 3 gal/A, offers the most effective control of higher populations of nematodes and provides economically justified control at lower populations as well. In a series of on-farm field trials, the yield advantage to Telone II versus a nematicide seed treatment ranged from 225 lb lint/A to over 600 lb of lint/A for more damaging populations of nematodes. The point? Growers should use the right "bullet" for the right field.

In a summary of 30 on-farm trials (UGA Cooperative Extension) comparing seed-treatment nematicides to Temik 15G, 5 lb/A, AVICTA Complete Cotton out-yielded Temik in 11 trials and Temik out-yielded AVICTA Complete Cotton in 19 trials. Where AVICTA out-yielded Temik, the yield advantage was about 55 lb lint/A. Where Temik out-yielded AVICTA, the average yield advantage was about 100 lb lint/A. The point? There are cotton fields in Georgia where use of AVICTA Complete Cotton (or AERIS Seed-Applied System) is an appropriate strategy for effective management of nematodes based upon yield performance and convenience. However there are also many cotton fields in Georgia where Temik 15G offers control of nematodes and yield advantage that surpasses that of the nematicide seed treatments. In short, based upon our data, Temik 15G, 5 lb/A, can provide effective management of nematodes on cotton over a broader range of conditions than seed treatments do.

When the target is seedling disease, failure to effectively manage seedling disease can result in the need to replant entire fields. The most common seedling disease of cotton in Georgia is caused by the pathogen *Rhizoctonia solani*; however other fungi like *Pythium* may cause damage in some situations. Below are what we at the University of Georgia believe are the fundamentals to successfully managing cotton seedling diseases.

1. Do not plant cotton if conditions threaten to turn cold and wet soon after planting, even if you are willing to use additional fungicide treatments. (The final days of March, 2009,

are examples of when NOT to plant cotton!) In such conditions, the slow germination and sluggish growth of the cotton seedlings allows them to be overtaken by disease.

2. When possible, plant seeds in warm soils with sufficient moisture to promote rapid germination and vigorous growth. This will not eliminate seedling disease, but will get the young plants off to a great start to outgrow the pathogens.
3. Do not plant cotton seed that has not been treated with a combination of fungicides; this is normally not a problem as commercial seed is already treated. The combination of products is important to assure control of multiple pathogens, e.g. *Rhizoctonia* and *Pythium* and *Fusarium*.
4. Rotating cotton with grass crops like corn will help to reduce the populations of *Rhizoctonia* in a field and perhaps reduce seedling disease.
5. Consider use of additional seed treatment fungicides or in-furrow fungicides. From our research data, we believe that most cotton growers who plant under favorable conditions get little additional benefit from fungicide "overcoats" or in-furrow fungicides versus standard commercial treatments alone. Though there might be a slight increase in stand, in our trials this typically does not translate into extra yield. **Growers are most likely to see benefit from investment in additional fungicide treatments if:**
    a. The cotton crop must be planted when cooler and wetter conditions prevail.
    b. A particular field has a history of seedling disease problems.
    c. The grower simply wants additional insurance for protection from stand losses.
    d. Poor rotation has led to significant problems with *Rhizoctonia*.

Failure to effectively manage nematodes or seedling diseases prior to closing the furrow typically results in one of two situations. First, especially for seedling disease, the grower finds it necessary to replant. Second, the grower may try to limp the crop along for the remainder of the season never able to reach the genetic potential of the variety or match the yield potential based upon irrigation, fertility, weed, and insect control. Bottom line- make the bullet aimed at nematodes and seedling disease count.

Valent Tank Cleaner (*Prostko*). For growers who are concerned about spray system contamination from Valor, Valent has developed a tank cleaner specifically designed to remove Valor residues from the system. The name of this product is easy to remember (Valent Tank Cleaner). Does a grower have to use this specific tank cleaner? NO! There are others available such as Incide-Out (Precision Labs, Inc.). What's the difference between the 2 spray tank cleaners? Valent Tank Cleaner contains 15-30% sodium hydroxide (NaOH) and Incide-Out contains 10-15% potassium hydroxide (KOH) + surfactants. Both are bases which will raise the pH of water. The hydrolysis of Valor is rapidly increased in higher pH's (Table 1.)

Table 1. pH Effects on the Hydrolysis of Valor

pH	Half-life
5	3.4-5.1 days
7	21.4-24.6 hours
9	14.6-22.0 minutes

Any grower who uses Valent Tank Cleaner should follow the directions listed below:

1) Completely spray out or empty any Valor spray mix from the sprayer.
2) If Valor was ever left one time overnight in the spray tank, add water to that level; if not, just add 100 gallons of water to the spray tank.
3) Add 1 gallon of Valent Tank Cleaner/100 gallons of water in spray tank *(any ratio less than this will result in less than desirable cleanout)*
4) Agitate for 10 minutes. Then charge pumps, hoses, and nozzles by spraying solution through the sprayer for 5 minutes.
5) Shut off sprayer and keep hoses/nozzles "charged" overnight *(minimum of 12 hours)*
6) The next morning, spray out solution through the boom for 10 minutes and then drain remaining solution until sprayer is empty.
7) Flush spray tank with clean water and empty. Check all strainers, filters, nozzles, and screens as this process can "strip" old residues from within the sprayer system.
8) Any questions regarding the use of Valent Tank Cleaner can be directed to your local Valent representative.

Cotton Scout School Tifton, June 8, 2009 (*Roberts*). 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 8, 2009 at the UGA Tifton Campus Conference Center. Additional information for the Tifton Cotton Scout School and others will be forthcoming in future newsletters.

Can You Grow Cotton Without Reflex and Valor (*Culpepper*)? Certainly by now, cotton growers are well aware of glyphosate-resistant Palmer amaranth and the impact it is having on Georgia's cotton industry. Surviving the battle against this resistant pest has been and will continue to be a significant and often overwhelming challenge.

Residual Palmer amaranth control from Valor or Reflex *(PPO inhibitor herbicides, both with the same mode of action)* is the backbone of many herbicide programs managing glyphosate-resistant Palmer amaranth. A cotton grower could potentially use Valor for burndown, Reflex preemergence, Reflex late-directed, and Valor again at layby. Wow, this would provide excellent residual Palmer control…..for a year, maybe two…but eventually Palmer amaranth would likely develop resistance to these herbicides because they are simply so good! Palmer amaranth resistant to glyphosate, ALS inhibitor herbicides, and the residual activity of the PPO herbicides (Reflex and Valor especially) would eliminate economical cotton production in Georgia.

Thus, it is critical for growers to develop programs ***using Reflex OR Valor once in a cotton crop,*** but if this is not possible, then certainly make ***no more than two applications of PPO inhibitor herbicides on the same field over a two-year time period.*** Below are weed management programs recommended for the control of glyphosate-resistant Palmer amaranth while attempting to protect all of our herbicide chemistry and possibly our ability to grow cotton!!!!

Table 1. **Managing Glyphosate-Resistant Palmer amaranth with Ignite-based programs in Liberty Link cotton.***

Preplant or Preemergence (PRE)	Topical (1- to 4-leaf cotton)	Layby Directed
Conventional Tillage Production - PRE applications Reflex[1] + diuron; Reflex[1] + Prowl[2]; Reflex[1] + Staple LX[3] ; Staple LX[3] + diuron; Staple LX[3] + Prowl[2]	Ignite + Dual Magnum ***(Palmer < 2")*** Or Ignite + Staple LX[3] **(Palmer < 3")** *Ignite at 23 oz/A will not consistently control Palmer larger than 2 inch. Increase rate to 29 oz/A for Palmer 3- to 4-inch in size.*	MSMA + diuron MSMA + Layby Pro MSMA + Valor[1] + diuron
Conservation Tillage Production Valor[1,4] preplant followed by diuron + Staple LX[3] + paraquat PRE; Valor[1,4] preplant followed by Prowl + Staple LX[3] + paraquat PRE or paraquat + Reflex[1] + Staple LX[3] + diuron PRE; paraquat + Reflex[1] + Staple LX[3] + Prowl PRE		

* Cotton cultivar must be resistant to Ignite 280 (glufosinate) herbicide or serious crop injury can occur.

Table 2. **Managing Glyphosate-Resistant Palmer Amaranth in Roundup Ready Cotton.***

Preplant Incorporated (PPI) or Preemergence (PRE)	Topical (1- to 4-leaf cotton)	Layby Directed
Conventional Tillage Dryland Production[5] Prowl PPI + Reflex[1] PRE or Treflan PPI + Reflex[1] PRE	Glyphosate + Dual Mag. ***(no Palmer emerged)*** OR Glyphosate + Staple LX[3] ***(Palmer 1")***	MSMA + diuron MSMA + Layby Pro MSMA + Valor[1] + diuron
Conventional Tillage Irrigated Production Reflex[1] + Staple LX[3] PRE; Reflex[1] + diuron PRE; Reflex[1] + Prowl[2] PRE;		
Conservation Tillage Irrigated Production Valor[1,4] preplant followed by diuron + Staple LX[3] + paraquat PRE; or Valor[1,4] preplant followed by Prowl + Staple LX[3] + paraquat PRE or paraquat + Reflex[1] + Staple LX[3] + diuron PRE; or paraquat + Reflex[1] + Staple LX[3] + Prowl PRE		

*Hand weeding, cultivation, and/or application of paraquat mixtures with hooded sprayers will likely be needed.

Table 3. **Delaying the arrival of glyphosate-resistant Palmer amaranth in Roundup Ready Cotton.**

Preplant or Preemergence (PRE)	Topical (1- to 4-leaf cotton)	Layby Directed
Conventional Tillage Production Cotoran, diuron or Prowl[2]	Glyphosate + Dual Mag. or Staple LX[3]	MSMA + diuron MSMA + Layby Pro MSMA + Valor[1] Glyphosate + diuron Glyphosate + Layby Pro Glyphosate + Valor[1]
Conservation Tillage Production Valor[1,4] preplant with Cotoran, diuron, or Prowl + paraquat PRE	Glyphosate as needed	

1. Make only one application of either Valor or Reflex throughout the season for resistance management.
2. Incorporated applications of Treflan or Prowl will perform more consistently than Prowl PRE applications.
3. Make only one application of an ALS-inhibiting herbicide (Staple, Envoke, Suprend) per season. Will not control ALS-resistant Palmer.
4. A 14-day interval is needed between Valor application and planting if a strip-till operation occurs after applying Valor but before planting.
5. In dry land production, diuron, Cotoran, or Staple added with Reflex PRE may improve control once activated by rainfall.

How Long will the Yellow Herbicide Provide Control (*Culpepper and Grey*)? With significant rainfalls occurring over the past couple of weeks, many have asked questions about the length of residual weed control offered by some herbicides, especially the yellow herbicides. The typical half-life (time period which is required for degradation or breakdown of half the amount of product sprayed) of yellow herbicides ranges from 42 to 45 days. This can be slightly increased if the product is incorporated into the soil and will be greatly reduced if the product sits on the soil surface without incorporation. Degradation of the yellow herbicide through sunlight is relatively minor; however, losses through volatilization and anaerobic conditions can be much more severe. Volatilization can be managed in many situations by incorporation through mechanical practices or by rainfall/irrigation. However, breakdown of these herbicides from anaerobic conditions are more complicated and less manageable. Anaerobic conditions essentially occur when the herbicide sits under standing water. Some data suggest in these anaerobic conditions, breakdown can occur as quickly as 7 days.

Avoiding Reflex plus Glyphosate Tank Mixing Issues (*Culpepper*)? Reflex has become quite common as a preemergence herbicide to battle glyphosate-resistant Palmer amaranth in cotton. Over the past couple of years, there have been some tank compatibility issues when mixing Reflex and various brands of glyphosate. Recently, Syngenta has provided the following steps to avoid these issues (for their entire bulletin contact your local Syngenta representative):

1. Avoid mixing Reflex with Touchdown HiTech, Roundup Original Max or Roundup WeatherMax.

2. Mixing order:
    A. Fill spray tank ¾ full with clean water.
    B. Begin tank agitation and continue throughout mixing and spraying.
    C. Add AMS (if needed).
    D. Add Reflex to tank.
    E. Add glyphosate formulation to tank.
    F. Add nonionic surfactant or wetting agent (if needed).
    G. Fill remainder of spray tank.

3. Ammonia Fix if Incompatibility (Precipitate Occurs): If Reflex plus glyphosate have been mixed together and a precipitate forms in the spray tank, add ammonia (household) to the spray tank at a concentration of 2% of the total tank volume to remove precipitate.

4. Additional Recommendations:
    A. Mix and spray immediately.
    B. Spray volumes of 15 GPA or greater should be utilized.

Contributions by:

Stanley Culpepper, Extension Agronomist – Weed Science
Glenn Harris, Extension Agronomist
Bob Kemerait, Extension Plant Pathology
Eric Prostko, Extension Agronomist – Weed Science
Phillip Roberts, Extension Entomology
Don Shurley, Extension Ag Economics
Amanda Smith, Extension Ag Economics

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

Edited by: A. Stanley Culpepper, Extension Agronomist-Weed Science