



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



# Georgia Cotton

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**APPLY YOUR 2,4-D IN CONSERVATION TILLAGE COTTON? (*Culpepper*)** Controlling cutleaf eveningprimrose and wild radish has proven difficult and often unsuccessful as these weeds are tolerant to glyphosate (Roundup, others) and paraquat (Gramoxone Max) applied alone. The addition of a tank mix partner with glyphosate or paraquat or making sequential herbicide applications is recommended for controlling intense populations of these weeds in conservation tillage cotton.

The most consistent and effective herbicide program for Georgia growers, with or without a covercrop, is an application of 2,4-D in February or early March followed by either glyphosate or paraquat near planting. The second most effective program is mixing glyphosate or paraquat with 2,4-D and applying at least 30 days prior to planting (some 2,4-D products require application at least 90 days prior to planting, read and follow all label recommendations of the product you use).

2,4-D is a very economical and effective herbicide; however, be especially aware of drift to off-target crops as well as spray tank contamination. Amine formulations of 2,4-D are recommended for burndown applications.....DO NOT APPLY ESTER FORMULATIONS OF 2,4-D!

**CLEAN THE 2,4-D RESIDUE FROM YOUR TANK (*Culpepper, York*)** If one applies 2,4-D at burndown, spray tank contamination issues must be addressed prior to using the same sprayer in sensitive crops such as emerged cotton.

### **Sprayer Contamination**

Cotton injury can occur from minute residues of 2,4-D in a sprayer. It is recommended that any sprayer previously used to apply 2,4-D not be used in cotton. If such a sprayer must be used, it should be washed thoroughly before spraying cotton. Special attention should be given to sprayers used to apply glyphosate products or emulsifiable concentrates because these products seem to be particularly effective at pulling 2,4-D residues out of a sprayer.

The following procedure is suggested for washing out sprayers that have been used to apply 2,4-D. Keep in mind this procedure may not totally remove 2,4-D residues. Dispose of rinsates in an approved manner.

1. Remove nozzles, nozzle strainers, and in-line strainers. Using a soft brush, wash the nozzles and strainers with soapy water. Be sure to remove any visible deposits.
2. Before replacing nozzles and strainers, fill sprayer tank with water and add a strong detergent such as 4 pounds of trisodium phosphate per 50 gallons of water or a commercial spray tank cleaner. Agitate for 15 minutes and then flush about one-fourth of the water-detergent mixture through the lines. Replace nozzles and strainers and flush remainder of water-detergent mixture through the nozzles.
3. Spray diesel fuel on the inside surfaces of the tank. Start the sprayer to fill the lines, and let the diesel fuel sit in the lines for several hours, preferably overnight. Then spray out the diesel fuel. **Note:** this step is suggested only if the sprayer has previously been used to apply an ester formulation of 2,4-D.
4. Fill the tank with water and add household ammonia at the rate of 1 quart per 25 gallons of water. Agitate for 15 minutes, spray a few gallons of the mixture through the nozzles, and let the remainder sit in the tank and lines for several hours, preferably overnight. Then spray out the remainder of the ammonia-water mixture.
5. Fill the tank with water and detergent. Agitate for several minutes and spray it out.
6. Fill the tank with fresh water and spray it all through the nozzles.

**COTTON BURNDOWN QUESTIONS AND ANSWERS FOR THE LAST WEEK OF MARCH.**  
*(Culpepper).*

**1. Will Roundup (glyphosate) kill radish?** Typically a recommended rate of glyphosate (1 lb ai/A) will provide 60 to 80% control of wild radish. Mixing Harmony Extra or 2,4-D with glyphosate would be the most effective tank mix partner. Glyphosate plus Aim or Valor would be more effective than glyphosate applied alone. Additionally, once radish begins the seed production stage of development, Gramoxone plus Direx becomes a valid option. (Always follow plant back restrictions of any herbicide used).

**2. How effective is Ignite on cutleaf eveningprimrose and wild radish?** Currently data are limited but it appears that Ignite is very effective for the control of cutleaf eveningprimrose but control of young wild radish is poor. Effectiveness of Ignite on mature (seeding) radish is still being evaluated.

**3. Can I mix diuron with Roundup (glyphosate) for burndown?** A mixture of glyphosate plus diuron is extremely effective in controlling many broadleaf weed species. However, occasionally diuron in this mixture reduces activity (usually grasses) of glyphosate. Several small grain fields treated with glyphosate plus diuron last year were re-treated just to kill the small grain because of this antagonism. Because of this potential concern, the University of Georgia and chemical manufacturers usually do not recommend this mixture for burndown.

**4. Do I need to kill my weeds prior to planting cotton even with Roundup Ready technology?** Planting cotton into living weeds is a mistake! Yields losses from early season competition, regardless of whether it is a weed or a small grain cover crop, can reduce yields significantly (23% loss last year in research trials). Weeds and cover crops should be killed prior to planting. In years such as this one where we are extremely dry, it is critical to kill weeds and cover well before planting to conserve moisture.

**CONTENDING WITH DRY CONDITIONS AT PLANTING. (Brown)** The most challenging aspect of stand establishment in Georgia is soil moisture. While recent years have been plagued with drought, the 2003 season seemed to mark an end to a multi-year dry spell. However, March 2004 was among the driest on record for many locations, and some climatological forecasts suggest the planting period of April to early June will bring above normal temperatures and below normal rainfall. [Of course, we hope the prediction is wrong!]

DRY conditions prevail as the 2004 planting season approaches. There is no “silver bullet” solution to spring drought – except rain – but here a few pointers to tilt the advantage in order to achieve a good stand of cotton.

*In conservation tillage, eliminate cover crop or weed vegetation early.* Active growth of cool season vegetation depletes soil moisture. As winter cover crops and weeds advance toward maturity they consume progressively more water. Effective burndown treatments stop plant growth and water consumption. Early termination of vegetation significantly reduces soil moisture loss and saves available reserves for the crop. Delays in vegetation kill can actually

compound moisture problems by totally “draining” soil water for cover growth. Timely cover termination can result in water conservation that provides a slight edge for cotton establishment.

*Rip-bed culture provides an opportunity to plant into moisture.* Conventional tillage in cotton involves ripping (subsoiling) and bedding. Raised beds tend to accumulate moisture. Even in the driest of conditions, soil moisture moves into the lower portion of beds. Forming beds well before planting allows replenishment of soil water by upward movement and/or rain. Knocking off the top of the beds at planting allows seed to be placed into moisture... at least for a brief period. Success depends on how much moisture is present, how deep seed is planted, and how fast moisture evaporates.

*Be ready when it does rain.* When it does rain, surface moisture may leave in a hurry. In both conservation and conventional tillage systems it is imperative to capitalize on rain to put the seed in the ground. Remember that every tillage pass will decrease soil moisture, so as moisture gets scarce, disking, etc., should be kept to a minimum. Unless mid-April temperatures are forbiddingly cool, producers should be prepared to plant non-irrigated fields anytime soil moisture is adequate.

*Adjustments on the planter may reduce the amount of dry soil in the furrow.* Planters use force to open and close a furrow and to insert seed between those events. Planter set up can unnecessarily push excessively dry soil back into the furrow. Watch planter units at full operating speed to see if this occurs and look for ways to tweak the system. This may include changing down pressure as well as the type and alignment of gauge wheels and press wheels. Sometimes a slight but effective change can be wrought with a few bangs of a hammer.

#### **PLANTING TIPS AND COMMENTS (*Brown*)**

- ✓ Don't plant small seeded, low vigor seed/varieties (i.e. DP 555 BG/RR) too early. Wait for soil temperatures to consistently reach 70° F before proceeding. Typically, that means delaying planting with these varieties until at least the last 10 days of April.
- ✓ Other than the exception stated above, it is usually safe to plant most varieties when soil temperatures reach the low to mid-60's F. Soil moisture is often more limiting than temperature.
- ✓ Rates of 2.5 to 3 seed/ft are adequate for many situations.
- ✓ Both D&PL and Stoneville are marketing varieties based on seed count per bag in 2004. Counts are 250,000 and 230,000 seed/bag for the two companies, respectively. Because the unit is based on count, bag weights vary by variety and seed lot. Weights range from 40 to 65 lb/bag.
- ✓ Because the unit is based on count and not weight, there is no advantage (in terms of reducing technology fees) in purchasing small seed.
- ✓ Because of the need to spread planting and harvest, using multiple varieties on a farm continues to be an important part of spreading risks.

✓ Where rotary hoeing is needed for stand emergence, timely intervention is absolutely critical. Most often, crust breaking with a rotary hoe should occur 3 to 4 days after planting.

✓ In conservation tillage, it is imperative that existing vegetation – winter weeds, cover crops, and emerging summer weeds – be eliminated prior to cotton emergence.

**SEEDING RATES (*Jost*)** Seed costs and technology fees are ever increasing. Attempting to reduce per acre costs by reducing seeding rates is becoming a common practice. It is almost universal knowledge that the cotton plant has the ability to compensate for varying plant populations, whereby we see equal yields from varying plant densities. This should not be taken to the extreme. Once the seed has been planted many decisions and inputs into the crop have been made. The genetic potential for the field has been determined, the weed control program established, and nematode control measures and thrips management implemented.

As stated previously a seeding rate of 2.5 to 3 seed/foot is adequate for most situations. I have been asked about hill-drop seeding rates as low as 2 every 12, 13 or 14-inches. These rates are really on the low end. Since there is so much invested by the time planting is accomplished, we should do all we can to insure that we achieve a good uniform stand. Decisions to replant are difficult times.

Attempts to cut seeding rates and thereby save input \$ can be costly. Planting decisions which create thin stands sometimes result in significant skips. Skips of 2.5 to 3 ft directly affect yield. In studies last year, yield losses of 100 lb/A occurred were measured when 3 ft skips were scattered in a stand. The consequences of having to replant in June were even more severe.

Bottom line is don't sacrifice 100 lbs lint or more to save \$10 to \$15 at planting.

**PROTECTING COTTON FROM THE FURROW (*Kemerait and Seebold*)** From 1914 until 1918, huge armies slugged it out across Europe using the particularly vicious and, in the end, fruitless tactic of “trench warfare”. Thankfully, modern military strategists have moved beyond over-the-top frontal assaults into a hail of machine gun fire; however cotton farmers are faced with their own version of a fight in the trenches. For growers, the trench is the open furrow, the battleground is the cotton field, and the enemy is not the Huns, but the pathogenic fungi that can cause injury and death to emerging seedlings and young plants.

Seed rots and seedling diseases of cotton occur in every cotton field in Georgia each year. Thankfully, the severity of stand loss and resulting yield loss is inconsequential in most instances. Growers can effectively minimize their risk of seedling disease by practicing good crop rotation, planting in warm soils (temperature at 4 inch depth at least 65° F), delaying planting if cool, wet weather is in the 5-day forecast, and by using quality seed (good-to-excellent cold germination value) that has been treated with a standard fungicide regime. For most growers in the state who follow these steps, the seedling disease that does occur in a field will have minimal impact on the crop.

Cotton growers know that there are a number of additional products on the market that are sold to protect the seed and young seedling from injury to fungal pathogens and to provide some measure of “stand insurance”. Unlike pointless head-on charges through rows of barbed wire during the First World War, the fungicides that are sold to cotton growers for extra protection are effective against pathogens and theoretically have a place in our cotton disease management program. Most of the fungicides and biological organisms that are formulated into additional seed treatments, hopper box treatments, and granular or liquid in-furrow treatments are proven to affect fungal pathogens, at least under controlled situations. **The real question is not “Do these treatments control fungal pathogens?” but “Will I get enough yield benefit from these products to offset the additional expense?”**

For most growers in Georgia, especially those in the southern part of the state, using quality seed that has been commercially treated with a fungicide and planting when conditions are favorable for rapid germination and growth will be enough to combat seedling diseases. It’s not that the additional products are not effective, but it demonstrates the value from the treatments on the seed that the grower buys. Many “opportunistic” fungal pathogens, in addition to the important pathogens *Rhizoctonia* and *Pythium*, can exist on the seed and in the soil. If left unchecked, these pathogens can cause a seed rot and eliminate germination. *Rhizoctonia*, *Pythium*, and other pathogens, such as *Fusarium*, can attack the young plants and cause both pre-emergent and post-emergent damping off. “Soreshin”, post-emergent damping-off caused by *Rhizoctonia solani*, is typically the most important seedling disease of cotton in Georgia. Commercial seed treatments often provide the grower all that is needed to manage these pathogens.

### **Do cotton growers in Georgia need additional fungicide treatments to control seedling diseases?**

The simple answer is “Maybe”. Unlike cotton growers in the Mid-south or in northern Alabama and western Tennessee, Georgia’s growers often do not need additional treatments. Research at the University of Georgia since 2000 has demonstrated that some treatments, such as the use of in-furrow fungicides, do significantly increase stand over commercially treated seed alone; however yield benefits are rarely observed. **Still, there are times when a grower should consider using an additional fungicide.** If a grower is planting in a poorly rotated field where seedling disease has been a problem in the past, then an in-furrow fungicide may help. If a grower is planting when soils are wet and/or cool (less than 65° F), additional treatments may help as well. Also, if in an effort to reduce seed costs, a grower uses a lower seeding rate than normal, it may be of some benefit to “insure” the stand with additional fungicides. We in the Cooperative Extension Service do not discourage growers from using additional seedling disease treatments. However we do caution the grower to consider whether or not the treatment is really needed.

What additional fungicide treatments are most effective to manage seedling diseases?

Additional treatments for seedling disease can be broken into seed treatments, hopper box treatments, and in-furrow fungicides. The fungicides that are placed into seed treatments like Delta Coat (chloroneb + metalaxyl) are effective against pathogenic fungi; however they are providing similar control to what is already on the seed. Extra seed treatments are typically the least expensive and easiest to apply of the additional fungicides, but they are also the least likely to provide additional protection and increased stand. Hopper box treatments, like Prevail

(carboxin + PCNB + metalaxyl), are mixed directly with the seed in the hopper box and are deposited in the furrow with the seed. These products may provide additional benefits to disease protection, but we have not found a yield increase in our trials. The most effective, yet most expensive, treatments are in-furrow fungicides that are applied from a second hopper or a spray nozzle into the open furrow with the seed. The real advantage of the in-furrow fungicide is that the grower is treating not only the seed, but the surrounding soil as well. Our best results to achieve better stands have come in situations where we used an in-furrow fungicide. Use of a granular in-furrow fungicide requires calibration of the applicator and also a hopper box in which to place the fungicide. Some growers are not able to do this if they are also applying Temik at planting, unless they have a split hopper box. Liquid in-furrow fungicides provide the best treatment of the soil. Proper application of an in-furrow fungicide requires calibration, plumbing for the spray apparatus, and a tank to carry the fungicide into the field. Growers who are applying herbicides or fertilizer at planting may not have this capability.

**RECONSIDER USING A YELLOW HERBICIDE IN ROUNDUP READY COTTON (*Culpepper*).** Many growers have removed the yellow herbicide (Prowl, Treflan, etc.) from their Roundup Ready cotton weed management programs. In many Georgia fields, this is a big mistake. A few reasons to consider the use of a yellow herbicide, even in Roundup Ready cotton, are listed below:

1. **Control of Florida pusley.** This weed CAN NOT be consistently controlled after it has emerged. An effective soil-applied herbicide, such as a yellow herbicide, is STRONGLY encouraged prior to pusley emergence.
2. **Alleviation of early-season weed competition.** Without the use of a yellow herbicide or other soil-applied herbicides, glyphosate applied twice prior to the fifth leaf of cotton development following label recommendations will be needed on approximately 40% of our acres to avoid yield loss (23% or more) to early season weed competition.
3. The yellow herbicides are very **economical** and if activated by rainfall or irrigation offer control or suppression (depending on application method) of many of our more common weeds including Florida pusley, Palmer amaranth, and Texas panicum.
4. **Increased Flexibility and Insurance.** Environmental, labor, or equipment issues do occur and often delay an intended timely application of glyphosate. A yellow herbicide offers some flexibility in the application timing by reducing weed size and populations at time of the first glyphosate application. Of course, with or without the use of a yellow herbicide, glyphosate should not be applied topically after the fifth leaf stage of Roundup Ready cotton.

**UP TO DATE WEATHER INFORMATION ON THE WEB. (*Brown*)** The Georgia Automated Environmental Monitoring Network provides weather and environmental data from over 45 sites across the state, many in the cotton-production areas. Data include air temperature, soil temperature, rainfall, soil moisture, solar radiation, relative humidity, and wind speed. Recent and historical data are accessible, and the site includes calculators for heat unit accumulation.

Overall, the site is an incredible source of information for agriculture. The web address is [www.GeorgiaWeather.net](http://www.GeorgiaWeather.net) or [www.griffin.uga.edu/aemn](http://www.griffin.uga.edu/aemn).

**THRIPS MANAGEMENT: (Roberts)** Thrips are a predictable early season pest of cotton and the use of a preventive insecticide at planting for thrips control is recommended. Thrips are a potential pest from emergence until plants have attained five true leaves and are growing rapidly. Adults will infest cotton shortly after emergence and feed on cotyledons, damaged cotyledons will often be silvery in appearance. Both adult and immature thrips feed in the terminal bud on tender unfurled leaves causing expanding leaves to be distorted and crinkled. Thrips injury results in plant stunting, delays in maturity, reduced yield potential, and in severe cases loss of terminals and stand loss. Resulting plant injury is more pronounced when thrips infest younger seedlings.

Use of at plant insecticides for thrips control consistently provides positive economic returns. Several options for applying at plant insecticides are available and include in-furrow granules, in-furrow sprays, and seed treatments. Temik has historically been the standard for thrips control in Georgia. In addition to providing good thrips control, Temik also has nematode activity. Other in-furrow granule options include Thimet and Di-Syston. The potential for seedling injury exist when Thimet or Di-Syston are used, especially when high rates are used or certain herbicides are used (refer to insecticide labels). An in-furrow spray option includes Orthene. Seed treatments offer convenience at planting and include Cruiser, Gaucho, and Orthene. Orthene treated seed provide limited thrips control (about 7 days), whereas Cruiser and Gaucho will provide control for about three weeks.

We have received several questions related to Temik and the seed treatments Cruiser and Gaucho. When compared to other treatments, Temik provides greater and longer residual control of thrips. Length of residual control with Temik is rate dependent. Cruiser and Gaucho will often provide acceptable control, but tend to be more erratic in performance, especially on April and early May plantings. Thrips populations tend to be higher during April and early May. Additionally, plant growth may be delayed if cool conditions exists which extends the time in which seedlings are susceptible to thrips attack. Thrips infestations also tend to be higher in conventional tillage compared with reduced tillage systems. In small plot research trials, yields tend to be similar when comparing Temik with Cruiser and Gaucho. In most cases these trials are conducted in locations with good rotation and low nematode populations. Regardless of which treatment is used, fields should be monitored for thrips and thrips injury at least weekly while seedlings are susceptible. If damaging infestations are found, a foliar insecticide such as Bidrin, dimethoate, or Orthene should be used.

**COTTON SCOUT SCHOOL: (Roberts)** The annual cotton scouting school held at the RDC in Tifton has been scheduled for Monday, June 14. All cotton in the state should be scouted for insects, and this training will give an introduction to insect identification and procedures for assessing insect populations and their damage. More information on this training and additional scouting schools held in County offices will be forthcoming.



**ZERO BOLL WEEVIL CAPTURES: (Roberts)** 2003 was a milestone year for the Georgia cotton industry in that no boll weevils were captured. This was the first calendar year in which no reinfestations occurred in the state of Georgia. The Boll Weevil Eradication Program (BWEP) was initiated during the fall of 1987 to eliminate this devastating pest and continues today monitoring for and treating boll weevil reinfestations if they occur. We all recognize the impact that the BWEP and remaining boll weevil free have on our industry.

**2004 COTTON ACRES EXPECTED TO INCREASE (Shurley, Brown, and Jost)** According to USDA's *Prospective Plantings* report released March 31, US farmers in a survey conducted March 1 said they intend to increase cotton planting by 6.8% this season (Table 1). Farmers say they intend to plant 14.4 million acres of cotton compared to 13.5 million last year. Intended acreage is up in every state except North Carolina and a very slight decrease in Mississippi. By region, acreage is expected to be up 3.5% in the Southeast, 4.9% in the Mid-South, 9.6% in the Southwest, and 7.2% in the West.

Georgia cotton producers say they intend to increase acreage by 3.8% to 1.35 million acres compared to 1.3 million acres last year but still below the 1.45 million acres planted in 2002. Soybean and peanut acres are expected to be up and, surprisingly, corn acreage is expected to be down (Table 2). These numbers are farmers "intentions" as of March 1 and can and will change based on crop prices, input costs, and planting weather and field conditions. The first estimate of actual 2004 acres planted will not be released until June 30.

Based on recent trends in prices and should these price levels hold, actual US and Georgia cotton acreage is expected to be less than the March numbers. For Georgia, actual cotton acreage could be closer to 1.25 million acres and corn and peanuts acres increase from the March estimate.

In recent weeks, prices for corn and soybeans have strengthened relative to cotton. Even at current price levels, cotton still holds a competitive advantage based on assumed yields and UGA cost estimates (Table 3). Producers should carefully budget their own situation for non-irrigated and irrigated situations and also consider risks, crop rotation, and management. Cotton prices reacted bearishly to the high number in the March report but are not expected to completely fall out of bed. Demand is expected to remain strong and should the acreage number eventually be adjusted downward (many already don't believe the number anyway) then prices should recover.

**Table 1. US Cotton Acres Planted (Thous. Acres), 2002-2003 Actual and 2004 Intentions <sup>1</sup>**

	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>% Change 2004-2003</b>
Alabama	590	525	550	+4.8
Florida	120	94	105	+11.7
Georgia	1,450	1,300	1,350	+3.8
N. Carolina	940	810	790	-2.5
S. Carolina	290	220	260	+18.2
Virginia	100	89	90	+1.1
<b>SOUTHEAST</b>	<b>3,490</b>	<b>3,038</b>	<b>3,145</b>	<b>+3.5</b>
Arkansas	960	980	1,050	+7.1
Louisiana	520	525	600	+14.3
Mississippi	1,170	1,110	1,100	-0.1
Missouri	380	400	410	+2.5
Tennessee	565	560	590	+5.4
<b>MID-SOUTH</b>	<b>3,595</b>	<b>3,575</b>	<b>3,750</b>	<b>+4.9</b>
Kansas	80	90	130	+44.4
Oklahoma	200	180	210	+16.7
Texas	5,619	5,620	6,116	+8.8
<b>SOUTHWEST</b>	<b>5,899</b>	<b>5,890</b>	<b>6,456</b>	<b>+9.6</b>
Arizona	223	218	223	+2.3
California	690	700	760	+8.6
New Mexico	61	62	68	+9.7
<b>WEST</b>	<b>974</b>	<b>980</b>	<b>1,051</b>	<b>+7.2</b>
<b>TOTAL U.S.</b>	<b>13,958</b>	<b>13,483</b>	<b>14,402</b>	<b>+6.8</b>

<sup>1</sup>/ SOURCE: USDA, March 31, 2004.

**Table 2. Georgia Acres Planted of Selected Crops (Thousand Acres)**

	<b>2002</b>	<b>2003</b>	<b>2004 Intentions <sup>1</sup></b>
Corn	340	340	330
Cotton	1,450	1,300	1,350
Peanuts	510	545	565
Soybeans	160	190	230
<b>TOTAL</b>	<b>2,460</b>	<b>2,375</b>	<b>2,475</b>

<sup>1/</sup> SOURCE: USDA, March 31, 2004

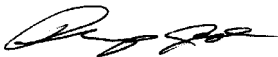
**Table 3. Example Comparison of Per Acre Net Returns, Non-Irrigated Production**

	<b>Price <sup>1</sup></b>	<b>Yield <sup>2</sup></b>	<b>Variable Costs <sup>2</sup></b>	<b>Net Return</b>
Corn	\$3.30	85	\$202	\$78.50
Cotton	\$0.62	650	\$312	\$91.00
Peanuts	\$375	2,500	\$393	\$75.75
Soybeans	\$7.45	30	\$141	\$82.50

<sup>1/</sup> Estimated contract opportunity as of 4/1/04. Peanuts, for example purposes, are price between the loan rate (\$355) and the earlier available \$400/ton contract price.

<sup>2/</sup> Based on UGA 2004 enterprise budget estimates.

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