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This issue of the Georgia Cotton newsletter will be the last hard copy printed. Future copies can be forwarded to you via e-mail or accessed at the UGA Cotton Website at www.griffin.peachnet.edu/caes/cotton.

For those who would like to receive an electronic copy, please send notification to Mrs. Ann Goodwin at anngood@uga.edu. Thanks.

Surviving 50 Cent Cotton. (*Brown*) In recent days, cotton prices have fallen to 15-year lows, even to the point that December futures briefly (we hope) dipped below 50 cents/lb. As a result, there is extraordinary pressure to grow the crop as cheaply as possible. The following are a few survival suggestions for the 2001 crop.

1. **Fix pH problems.** Low pH can easily reduce yields 200 lb/A or more. Last minute adjustments can be made with finely ground lime, an expensive input but one that will no doubt yield returns if pH is low.
2. **Reasonably apply N.** Our current fertility recommendations are based on yield goals ranging from 750 to 1500 lb/A. With prices for N skyrocketing, there is every incentive to be conservative. Match the rate with the need. Don't overdo.
3. **Skimp on seeding rates.** With Bollgard and Bollgard/Roundup Ready technology, pricing structure is based on a seeding rate of about 3.5 seed/ft. Considerable research indicates that for many producers, a target of 2.5 seed/ft is adequate. This provides a savings of over 25 percent in technology fees. However, be extremely cautious with

reduced seeding rates in situations in which poor seed/soil contact is achieved or where other stresses (ex. seedling disease, cool weather) hinder stand establishment.

4. **Use Roundup in RR cotton very carefully.** Research indicates that misapplication of glyphosate (Roundup Ultra Max and many other formulations) can reduce yields 200 lb/A. “Misapplication” refers to using over-the-top or sloppy directed treatments after cotton surpasses the 4th leaf stage. Applications beyond the 4th leaf should be made with precision directed equipment that eliminates spray contact with the crop above the cotyledonary node.
5. **Control stink bugs.** Over the past several years the number of insecticide applications has declined to about two foliar treatments per year. In our “low-spray environment,” stink bugs have become a key pest and can easily reduce yields 125 lb/A. While stink bugs are difficult to observe in the field, internal boll damage has proven to be a reliable indicator and threshold. Scouts and producers should heighten their alertness for stink bug activity in mid-July and later. Several pyrethroids as well as Bidrin and methyl parathion provide excellent control of stink bugs. The key is knowing when to spray.
6. **Match technology with need.** Bt cotton is an expensive input. Where it is needed, it has tremendous value; where it is not, it is costly insurance. While no one can predict worm pressure for the 2001 season, growers can make decisions based on pest levels over the past three or four years. Bt technology is a good choice where three or more worm sprays are anticipated or where other management factors make timely application of insecticides difficult. Roundup Ready cotton has gained popularity as evidenced by the fact that at least 65 percent of the 2000 crop was committed to varieties with the RR gene. To date, the RR cottons are rarely among the top varieties in high-yield tests. In fields with a high target yield (ex. 2.5 bales), conventional, Bollgard, or Bollgard/Roundup Ready varieties probably have greater potential.
7. **Avoid “snake oils” and other “miracle” products.** Enough said.

Skip Row Cotton—A Cost Savings Concept. (*Jost and Brown*) The current market situation has left growers searching for ways to significantly reduce production costs but maintain yields. While the benefits of proper soil pH and fertilizer (especially N) cannot be ignored in any situation, producers are still left grasping for additional ways to cut costs. One option which has received much attention of late is skip row cotton.

The simplest form of this system is one in which a row is left unplanted in a specific pattern. For example, two rows may be planted and then one not planted (a two and one skip). There are many variations in row width and skip width. A “modified two and one” pattern might include two rows planted on 36-inch or 38-inch spacing with a 50-inch skip. A “full skip” includes a pair of rows on a 36 or 38-inch spacing with a 72 or 76-inch skip, respectively. Some growers have expressed interest in “four and one” and “modified four and one” patterns.

How the various skip-row patterns affect yield is a question that cannot be answered sufficiently without in-depth research with modern varieties. Research from the distant (1970s and earlier) and recent (2000) past indicate that skip row yields can range from 70 to 105 percent of solid plantings. Conceptually, the compensatory ability of the cotton plant should prevent any dramatic losses in these planting patterns, provided that skips are not excessively wide. Compensation is illustrated by the fact that a wide range of plant densities in conventional row patterns often provides similar yields.

Skip row patterns reduce cost associated with (1) seed, (2) technology fees, (3) in-furrow insecticides (and other pesticides), and (4) picker operation. Reductions in banded herbicide applications may be offset by increased costs of weed control in skips. Savings may also accrue with in-season foliar applications that are “banded” over the rows rather than broadcast. Obviously, aerial applications fall into the latter category.

Specific considerations for skip row patterns include adjustments in operating widths of pickers, planters, and tillage equipment probably in that order of priority. Because picker costs are one of the major incentives for skip row plantings, picker setup is a critical first consideration. Two row pickers are extremely versatile in skip row plantings, while four-row pickers may require some modification, including the addition of gear boxes, bar extensions, and duct-work. Any cost savings will be forfeited if picker heads are “unoccupied;” in other words, if heads operate in a skip without actually harvesting cotton. Tooling up for land preparation and planting may require significant time and may not be compatible with standard spacings for other crops.

The following table offers a calculation of estimated savings in seed costs and increases in picking efficiency for various skip-row planting patterns. These estimates assume the following factors.

1. Rows are set on the conventional spacing of 38 inches.
2. In-row seeding rate does not change compared to conventional 36 or 38-inch rows.
3. Effective planted row width is calculated by including the skip. For example, in a 2 and 1 full skip, two rows occupy 114 inches not 76 inches (skip / row-row / skip which equals 38 inches / 38 inches / 38 inches). Therefore $114/2 = 57$ inches per row.
4. A four row picker is utilized and no picker head operates in unplanted rows.

Estimated Savings Associated with Four Skip Row Patterns

	2 and 1 (full)	2 and 1 (modified skip-50 inches)	4 and 1 (full)	4 and 1 (modified skip-50 inches)
inches/row	57	44	47.5	41
% reduction in seed, technology costs	33	13.6	20	7.3
% increase in picker “efficiency” (4-row unit)	33	13.6	20	7.3

Thrips Management. (*Roberts*) Thrips are annual pests of seedling cotton in Georgia and other parts of the southeast. Thrips damage young terminal tissues by rasping the leaf surfaces and feeding on the escaping plant juices. The result is newly developing leaves that are distorted and silvery in appearance. In most cases cotton plants recover from thrips damage. However, severe injury can delay plant growth, cause terminal abortion, or even kill young seedlings. Seedlings are most vulnerable to thrips damage from emergence to the 4-leaf stage. Once plants reach the 5-leaf stage and are growing rapidly, the likelihood of thrips injury is greatly reduced.

Thrips damage is typically more severe on early planted cotton. There are two primary reasons for this occurrence. First, seedling growth is not as vigorous during cool conditions common early in the season, and this extends the window during which the plant is most susceptible to thrips injury. Also, since the plant is growing slowly, feeding may occur on the same unfurled leaf for several days, causing damage symptoms to be more severe. Secondly, thrips populations are typically higher in April and early May, compounding the likelihood of injury for cotton planted in this period.

Since thrips are a predictable early season pest, an at-planting preventive systemic insecticide is recommended for management of early season thrips. Several preventive insecticides are available and include in-furrow granules, in-furrow sprays, and seed treatments.

Historically, Temik has been used on a large percentage of cotton planted in Georgia and has proven to be a consistent treatment. Our research suggests that Temik at 3.5 lbs. per acre, which is the “X” rate for thrips control. Higher rates are sometimes used when nematodes are also a target. There may be opportunity to utilize reduced rates of Temik for thrips control on later planted cotton when rapid seedling growth is expected. However, growers must accept more risk for thrips injury and be prepared to make foliar insecticide applications if needed based on field monitoring. Other in-furrow products such as Payload, Di-Cession, Thimet, and Orthene are recommended treatments.

Three seed treatments are also available. Orthene and Gaucho are recommended seed treatments and recently a new seed treatment, Adage, was also labeled. Orthene-treated seed provides thrips control for about 7 days after emergence. Gaucho and Adage will provide thrips control for a more extended time, but performance may be erratic when high thrips populations occur. As with any input, growers are encouraged to try “new-to-them” treatments on a limited basis to gain experience.

Weed Control in No-Till or Strip-Till Cotton and When to Apply a Yellow Herbicide.

(*Culpepper, Brown*). Cover crops (or heavy stands of winter weeds) should be killed at least 2 or 3 weeks before planting so as to avoid soil moisture depletion by the cover crop or weeds. This interval between initial application and planting affords an opportunity to retreat any streaks that were missed during the original application. In general, you should kill a small grain cover crop after tillering but before the crop becomes too large to manage. Excessive cover crop residue can cause problems in the strip tillage and/or planting operation.

Many growers have questioned when the most effective time is to apply a yellow herbicide (pendimethalin – Pendimax or Prowl) in conservation tillage cotton. Research indicates that the herbicide may be tied up on green plant matter that intercepts the product before it reaches the soil surface, which ultimately reduces weed control. Obviously, the larger and more dense the cover crop or weed mass, the lower the volume of herbicide that contacts the soil.

Thus, is it best to apply pendimethalin at burndown or wait and apply it at planting? This question needs further study and is a primary objective for 2001 research. There are several considerations relative to this issue.

If Florida pusley is an anticipated problem, then a yellow herbicide must be applied prior to its emergence. In 2000, some growers observed that Florida pusley emerged after burndown but before planting, leading to season-long problems with escapes. Once Florida pusley emerges, it cannot be controlled consistently with ANY cotton herbicide. Therefore, in these fields the addition of a yellow herbicide at burndown is probably warranted. Additionally, increasing the rate of the yellow herbicide up to the maximum labeled rate for a specific soil type may compensate for some of the yellow herbicide being tied up in the cover. Alternatively, split applications of yellow herbicide (applying approximately half at burndown and the other half at planting) may also be an effective approach. However, many growers are not willing to make two applications prior to planting, especially in Roundup Ready systems.

In areas in which Florida pusley is not a problem and growers are willing to make two applications prior to planting, research has shown a benefit of applying the burndown several weeks before planting and then following with pendimethalin at planting. This provides the most effective and extended weed control once the crop is established. This approach minimizes the interception of product with vegetative matter, increases the amount of product contacting the soil, and extends the longevity of control in the season. Remember that yellow herbicides often provide 6 to 8 weeks of control. Therefore, treatments applied 3 weeks before planting may only offer 3 to 5 weeks of control after the crop is planted.

The yellow herbicides also control many other small seeded annual grass and broadleaf weeds. Strong argument can be made to the overall benefit of these products in strip till plantings of either RR or conventional cotton. Keep in mind that the yellow herbicides need rainfall within 5 days after application for maximum activation.

Glyphosate Uses, Formulations, Adjuvant Recommendations, and Use Rates.

(*Culpepper*) Many formulations of glyphosate are now available for use in cotton. With the vast number of products to choose from, use patterns, rates, and adjuvant recommendations have become complex. Tables 1, 2, and 3 attempt to address these issues. As always, read and follow the latest label recommendations.

Special thanks to Dr. Alan York of NC State University for help in preparation of this section.

Table 1. Glyphosate products and registered uses in Roundup Ready cotton.

Brand Name	Registered Uses			
	Burndown, any variety	Selective applicator, any variety ¹	Preharvest, any variety	In-crop RR ² variety only
Acquire	Yes	No	Yes	No
Credit	Yes	No	Yes	No
Dupont Glyphosate	Yes	Yes	Yes	Yes
Gly-Flo	Yes	No	Yes	No
Glyfos	Yes	No	Yes	No
Glyfos Xtra	Yes	Yes	Yes	Yes
Glyphomax	Yes	No	Yes	Yes
Glyphomax Plus	Yes	Yes	Yes	Yes
Glyphosate Original	Yes	No	Yes	Yes
Rattler	Yes	No	Yes	No
Roundup D-Pak	Yes	No	Yes	No
Roundup Original	Yes	No	Yes	No
Roundup Ultra	Yes	Yes	Yes	Yes
Roundup UltraDry	Yes	No	Yes	No
Roundup UltraMax	Yes	Yes	Yes	Yes
Touchdown	Yes	Yes	Yes	Yes
Touchdown 5	Yes ³	No	No	No

¹Hooded sprays

²Roundup Ready

³Must be applied 35 days before planting.

Table 2. Description of glyphosate products and adjuvant recommendations.

Brand name	Formulation	Adjuvant recommendations
Acquire Credit DuPont Glyphosate Gly-Flo Glyphos Glyphomax Glyphosate Original Rattler Roundup Original	isopropylamine salt of glyphosate 4.0 lb a.i./gal 3.0 lb a.e./gal	Nonionic surfactant at 0.5% by volume (2 qt/100 gal) is generally recommended. Dry ammonium sulfate at 8.5 to 17 lb/100 gal may improve control under some conditions. If using ammonium sulfate, add it to tank first and completely dissolve before adding surfactant or pesticides.
Glyphos X-TRA Glyphomax Plus Roundup Ultra	isopropylamine salt of glyphosate 4.0 lb a.i./gal 3.0 lb a.e./gal	Additional surfactant not needed. Dry ammonium sulfate at 8.5 to 17 lb/100 gal may improve control under some conditions. If using ammonium sulfate, add it to tank first and completely dissolve before adding surfactant or pesticides.
Roundup D-Pak	isopropylamine salt of glyphosate 6.42 lb a.i./gal 4.75 lb a.e./gal	Nonionic surfactant at 0.5% by volume (2 qt/100 gal) always recommended. Ammonium sulfate at 8.5 to 17 lb/100 gal may improve control under some conditions. If using ammonium sulfate, add it to tank first and completely dissolve before adding surfactant or pesticides.
Roundup UltraDry	ammonium salt of glyphosate 71.4% a.i. 64.9% a.e.	Additional surfactant not needed. Ammonium sulfate at 8.5 to 17 lb/100 gal may improve control under some conditions.
Roundup UltraMax	isopropylamine salt of glyphosate 5.0 lb a.i./gal 3.45 a.e./gal	Nonionic surfactant at 0.25% by volume (1 qt/100 gal) recommended ONLY when herbicide is applied at less than 20 fl oz/acre or when applied in volumes of 30 GPA or greater. Dry ammonium sulfate at 8.5 to 17 lb/100 gal may improve control under some conditions. If using ammonium sulfate, add it to tank first and completely dissolve before adding surfactant or pesticides.
Touchdown	diammonium salt 3.57 lb a.i./gal 3.0 lb a.e./gal	Nonionic surfactant at levels up to 0.25% by volume (1 qt/100 gal) may be used. Dry ammonium sulfate at 8.5 to 17 lb/100 gal may improve control under some conditions. Liquid formulations of ammonium sulfate may be used at equivalent rates.
Touchdown 5	trimethylsulfonium 5.0 lb a.i./gal 3.45 lb a.e./gal	Nonionic surfactant at levels up to 0.25% by volume (1 qt/100 gal) may be used. Dry ammonium sulfate at 8.5 to 17 lb/100 gal may improve control under some conditions. Liquid formulations of ammonium sulfate may be used at equivalent rates.

Table 3. Comparison of glyphosate formulations.

Equivalent rates					
Brand names	Salt	Active ingredient (lb formulated salt/gal)	Acid equivalent, a.e. (lb/gal)	lb a.e./A	oz product/A
Credit Dupont Glyphosate Gly-Flo Glyfos Glyfos Xtra Glyphomax Glyphomax Plus Glyphosate Original Rattler Roundup Original Roundup Ultra	isopropylamine	4	3	0.375	16
				0.56	24
				0.75	32
Roundup UltraMax	isopropylamine	5	3.7	0.375	13
				0.56	19
				0.75	26
Touchdown	diammonium	3.57	3	0.375	16
				0.56	24
				0.75	32
Touchdown 5	trimethylsulfonium	5	3.45	0.375	14
				0.56	21
				0.75	28

Prepared by:

Steven M. Brown, Extension Agronomist-Cotton
Stanley Culpepper, Extension Agronomist-Weed Science
Philip H. Jost, Extension Agronomist-Cotton
Phillip Roberts, Extension Entomologist-Cotton