



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



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SO, IF I DIDN'T PUT 2,4-D OUT FOR BURNDOWN, WHAT IS THE NEXT BEST OPTION? (*Culpepper*)

Research and experience for many years have clearly shown that no-till or strip-till cotton growers should include 2,4-D in their cotton burndown programs. This product is one of the most economical and effective burndown herbicides in reduced tillage cotton production as it controls our two most troublesome weeds, cutleaf eveningprimrose and wild radish.

Additionally, 2,4-D if applied timely and at proper rates will control horseweed even if it is resistant to Roundup (by the way, horseweed resistance to Roundup (glyphosate) has been confirmed in 10 states with 2 additional expecting resistance).

Many growers worry about putting 2,4-D in sprayers as well as not wanting to wait the appropriate time after applying 2,4-D before planting cotton (30 days for 4 products; 90 days or until herbicide dissipates from soil for most other products). However, 2,4-D is so good in cotton burndown, growers need to figure out a procedure allowing the adoption of 2,4-D while avoiding these issues.

Alright, for the grower who just will not use 2,4-D, what are the options? There are several good options available for the control of cutleaf eveningprimrose, which is our most common and troublesome weed. Many growers are applying Aim or ET with their Roundup. Our data suggest they are getting little to no benefit in primrose control from adding Aim or ET with the Roundup, other than seeing necrotic speckling at 2 to 3 days after treatment. However, there are several effective options ONCE primrose starts to bloom. Gramoxone plus Direx (plant back 15 days) and Ignite (no plant back restriction) are as effective as 2,4-D combinations as long as the primrose is blooming at time of application and the temperature is warm (Table 1). Be aware that Ignite will not control young wild radish, most grain cover crops, as well as many other

“junk” weeds, such as immature red sorrel. Roundup plus Valor at 1 oz/A is another option that will control most weeds very effectively but will provide only fair to good control of cutleaf eveningprimrose and wild radish. When controlling primrose or radish with a Valor mixture, control will be greatly improved by increasing the rate up to 2 oz of product per acre.

Table 1. Blooming cutleaf eveningprimrose response to burndown herbicides.*

Herbicide options	Percent control 30 days after treatment
Roundup WeatherMax 22 oz	67 c
Roundup WeatherMax 22 oz + 8 oz of Weedar	100 a
Roundup WeatherMax 22 oz + Valor 1 oz + non-ionic surfactant	84 b
Gramoxone 32 oz	82 b
Gramoxone 32 oz + Direx 32 oz	98 a
Ignite 32 oz	95 a
*Data pooled over one location in both 2003 and 2004. Applications were made in mid April.	

TOTAL COST OF PLANTING TRANSGENIC VARIETIES BASED ON SEEDING RATES. (*Brown*) Not only have technology fees increased in 2005 but seed costs have also risen substantially. Below is a chart adapted from Greg Slaughter, County Extension Agent in Dodge County, which provides total costs per acre based on planting rates (seed/ft). These estimates combine both technology fees and seed costs and demonstrate the substantial expense of planting transgenic varieties.

As stated last month, technology charges in our region are based on the suggested seeding rate of 52,000 seeds/A and figure to be about \$34.70 and \$59.40 for Roundup Ready (RR) and Bollgard/Roundup (BR) varieties, respectively. This rate of 52,000 seeds/A translates to approximately 3.6 seeds/ft in 36-inch rows and 3.8 seeds/ft in 38-inch rows. Keep in mind that if rate exceeds 2.9 seeds/ft in 36-inch rows or 3.1 seeds/ft in 38-inch rows, the Roundup Rewards Program from Monsanto provides an opportunity to “cap” tech fees. Participation in the program limits technology costs at \$28 and \$48/A (on a whole farm basis) for RR and BR varieties, respectively. There is no similar program with seed charges.

The point is: **Set Planters with Care.** While cutting seeding rates saves \$, be especially careful not to go too far with early plantings under marginal weather or in conservation tillage systems in which seed-to-soil contact is less than ideal.

Planting Cost of RR Varieties

Variety	Maturity	Tech fee, \$/bag	Total cost, \$/bag*	Cost to plant, \$/A				
				2.5	2.75	3.0	3.5	4.0
				seed/ft				
DP432RR	E	\$167	\$267	\$39	\$42	\$46	\$54	\$61
DP434 RR	E	\$167	\$267	\$39	\$42	\$46	\$54	\$61
DP494 RR	M-F	\$167	\$267	\$39	\$42	\$46	\$54	\$61
DP436 RR	E-M	\$167	\$247	\$36	\$39	\$43	\$50	\$57
DP5415RR	M-F	\$167	\$247	\$36	\$39	\$43	\$50	\$57
DP5690RR	M-F	\$167	\$247	\$36	\$39	\$43	\$50	\$57
ST4793R	E-M	\$153	\$232	\$37	\$40	\$44	\$51	\$58
ST5303R	M	\$153	\$232	\$37	\$40	\$44	\$51	\$58
ST6848R	F	\$153	\$248	\$39	\$43	\$47	\$55	\$62
FM989RR	E	\$153	\$236	\$37	\$41	\$45	\$53	\$60
FM960RR	E	\$146	\$230	\$38	\$42	\$46	\$54	\$61
FM991RR	M	\$163	\$230	\$36	\$40	\$44	\$52	\$59
Phy410R	E-M	\$153	\$242	\$38	\$42	\$46	\$54	\$61
Phy510R	F	\$153	\$222	\$35	\$39	\$43	\$51	\$58

Total costs include both technology fees and seed charges. Seed costs range from ~ \$70 to \$100 per bag. DPL packages contain 250,000 seeds/bag; Stoneville and Phytogen 230,000 seeds/bag; and Fiber Max 50 lb/bag. Adapted from Greg Slaughter, Dodge County Extension Agent.

Planting Cost of B/RR Varieties

Variety	Maturity	Tech fee, \$/bag	Total cost, \$/bag*	Cost to plant, \$/A				
				2.5	2.75	3.0	3.5	4.0
				seed/ft				
DP451BR	E-M	\$286	\$366	\$53	\$58	\$64	\$74	\$85
DP458BR	M-F	\$286	\$366	\$53	\$58	\$64	\$74	\$85
DP449BR	M	\$286	\$386	\$56	\$62	\$67	\$78	\$90
DP488BR	M	\$286	\$386	\$56	\$62	\$67	\$78	\$90
DP455BR	M	\$286	\$391	\$57	\$63	\$68	\$79	\$91
DP445BR	E-M	\$286	\$391	\$57	\$63	\$68	\$79	\$91
DP444BR	E	\$286	\$391	\$57	\$63	\$68	\$79	\$91
DP555BR	F	\$286	\$396	\$58	\$64	\$69	\$80	\$92
ST4575BR	E-M	\$263	\$357	\$56	\$62	\$68	\$79	\$90
ST4892BR	E-M	\$263	\$341	\$54	\$59	\$65	\$75	\$86
ST5242BR	E-M	\$263	\$357	\$56	\$62	\$68	\$79	\$90
ST5599BR	M	\$263	\$357	\$56	\$62	\$68	\$79	\$90
ST6636BR	F	\$263	\$357	\$56	\$62	\$68	\$79	\$90
FM960BR	E	\$252	\$334	\$55	\$60	\$66	\$77	\$88
FM989BR	E	\$246	\$328	\$56	\$61	\$67	\$78	\$89
FM991BR	M	\$280	\$363	\$54	\$60	\$65	\$76	\$87

Total costs include both technology fees and seed charges. Seed costs range up to \$110 per bag. DPL packages contain 250,000 seeds/bag; Stoneville 230,000 seeds/bag; and Fiber Max 50 lb/bag. Adapted from Greg Slaughter, Dodge County Extension Agent.

WHAT IS A BAD SKIPPY STAND? (Jost) As shown above, many dollars/A can be saved with reducing seeding rates. Another item to notice is that on the above charts is that the lowest seeding rates shown are 2.5 seeds/foot. In a hill-drop situation that would amount to 2 seed every 10 or 11 inches. There were many growers discussing 2 every 12, 13, or 14 inches. Under perfect conditions if all seed come up and produce healthy plants these low rates may produce good yields. Perfect conditions don't happen every day.

In studies conducted in Midville last year we found that skips of 2 feet or greater were required to start reducing yields from a more optimal stand. While the number of these 2 foot or greater skips required to justify a replant were pretty high, replanting is not the only thing to consider. As stated in a newsletter article last year "don't sacrifice a 100 lbs of lint yield to save a couple more dollars at planting".

GETTING THE MOST OUT OF YOUR FERTILIZER DOLLAR – (Harris) By now you should be well aware that fertilizer prices are up. You should also have some ideas on how to deal with this issue and still make a good crop.

1. Soil Test – Soil testing is still the best way to guide your fertilizer program. It should take into account yield goals and tell you when you need an element and when you don't. Most soil test labs in the southeast use the same chemical extractants so the "numbers" for soil test levels should be comparable. Recommendations on the otherhand can vary depending on if you follow a 'feed the plant' or a 'feed the soil' philosophy. If you have been feeding the soil with maintenance fertilizer it may be a good year to withdraw on some of that investment.
2. Maintain proper Soil pH – Liming to the proper soil pH can help you get the most out of the fertilizer you apply plus nutrients already in soil. This is due to the effect of pH on nutrient availability. Letting your pH get too high can tie up nutrients such as manganese and zinc and letting it get too low will decrease yields due to aluminum toxicity. With 40 % of Georgia cotton now under conservation-tillage, remember to catch the drop in pH early by taking a shallow (2-3 inch) soil sample.
3. Know the Value of Chicken Litter – Based on current fertilizer prices, a ton of chicken litter is worth approximately \$35/ton. This is based on N, P and K and does not give any credit for other nutrients, organic matter, or slight liming capacity. It does account for the N only being about 60 % available compared to commercial fertilizer. If you do not need P, it also reduces the value to about \$20/ton. And remember that not all litter is created equal, that is it can really vary in nutrient content especially N. Some reports show only 20 pounds of N instead of 60 per ton.
4. Adjust Your N Rate - Don't be afraid to adjust your total N rate based on previous crop, growth history, and yield potential. If you're following peanuts or a legume cover crop give yourself a 30 lb N/A credit.

5. Split Your N Applications - To me, this is one of the best things you can do to get the most efficiency use out of your N fertilizer. The standing UGA recommendation is to apply $\frac{1}{4}$ to $\frac{1}{3}$ of your total N at planting and then the remainder at sidedress sometime between first square and first bloom. If you want to increase your efficiency even more, consider foliar feeding about 10 lbs N/a around the 4th week of bloom. At this growth stage, which is peak bloom, it is more efficient to foliar feed N directly through the leaves than to apply more N to the soil. In fact, soil N applications are not recommended after the 4th week of bloom since they will not increase yield. Finally, foliar feeding dryland cotton is a good way to catch up if you cut back on your preplant or sidedress N and then receive good rains and have a good yield potential.

UPDATE ON N-HIBIT SEED TREATMENT FROM EDEN BIOSCIENCE (*Kemerait*) Management of parasitic nematodes on cotton is of critical importance in Georgia and includes crop rotation, development of a strong root system, and the reduction of stress on the plants. Additionally, many growers in the state elect to use nematicides such as Temik 15G, Telone II, and perhaps Vydate in their efforts to control these pests.

The Cooperative Extension Service has received many questions already this season with regards to a seed treatment, N-Hibit, developed by Eden BioScience and marketed for its activity in the management of nematodes affecting cotton. Until recently, I knew very little about this product, but visited this week with a representative from Eden BioScience and appreciated a very candid conversation with him. Here is what I learned from our discussion.

1. N-Hibit is a seed treatment formulation of a harpin protein, like their foliar-applied product Messenger.
2. When applied as a seed treatment to cotton grown in pots in the greenhouse, this harpin protein has been observed by Dr. Terry Kirkpatrick at the University of Arkansas to provide some suppression of egg production by the southern root-knot nematodes. According to Dr. Kirkpatrick in an e-mail, he found, “in pots with soil infested with root-knot (i.e. southern root-knot nematodes), I see pretty consistently a slight reduction in the number of eggs laid by the females.” Limited research from the University of Florida has found a similar trend for reniform nematodes as well.
3. These studies have all been conducted in the greenhouse; some field data is available from Alabama; however it is very limited.
4. According to the representative from Eden BioScience, growers should be aware of the following:
 - a. N-Hibit is being sold for “management” but not “control” of nematodes on cotton.
 - b. N-Hibit is not being sold with any claim to increase cotton yields in the field.
 - c. N-Hibit is NOT being sold to replace current use of nematicides, but to increase the management of nematodes when used in combination with other products, such as Temik 15G. For example, if a growers feels he needs to use 5 lb/A Temik 15G for his nematode problem, then it could be beneficial to use the N-Hibit seed treatment IN ADDITION to the 5 lb/A Temik 15G. Cutting the rate of Temik 15G simply because you are adding N-Hibit is not recommended.

- d. It is estimated that the cost of N-Hibit will be in the neighborhood of \$3.50 - \$4.00/A.

5. I appreciated the candid discussion. My interpretation in this: In greenhouse studies, there has been a reduction in the number of eggs produced in individual egg masses for the southern root-knot nematode with the use of N-Hibit. It is not at all clear what affect this will have on production in the field. If a grower would like to try this product, and apparently there are growers in Georgia who are doing so, I would suggest treating part of a field with N-Hibit in addition to other nematicide products and treating the other part with the same nematicides WITHOUT the N-Hibit and comparing the results during the season and at harvest.

EARLY MANAGEMENT SYSTEM FOR HARVESTING COTTON BEFORE DIGGING PEANUTS.

(Brown) USDA estimates that Georgia farmers will increase peanut acreage substantially in 2005 – by as much as 21 percent or 130,000 acres more than last year. Pressure from Tomato Spotted Wilt Virus (TSWV) has shifted peanut planting dates from the latter half of April to the latter half of May. As a result, both peanuts and cotton are often ready to harvest at the same time.

One of the key challenges of having peanuts and cotton on the same farm is TIMELINESS of harvest. Physiologically, mature peanuts cannot wait. Harvest delays in peanuts can be catastrophic, but while not as costly in cotton, harvest delays can significantly reduce cotton yields and both fiber and seed quality.

One possible way to address this problem is to plant and manage a portion (perhaps 10 percent) of our crop so that it matures and is ready for harvest prior to mid-September, prior to the initiation of peanut digging. This spreads production risks and harvest. It also provides an opportunity to capture yield and fiber quality that might otherwise be lost.

A typical early management system might include

- **Plant in mid-April, at least by April 20 to 25.** Get the crop in early, but not too early.
- **Plant early to mid-season varieties.** Avoid full maturity offerings such as DP 555 BG/RR. A 4-week bloom period is sufficient to make 2.5 bales or more.
- **Don't over fertilize, particularly with N.** The object is to grow and mature the crop and have the plants begin to decline by mid to late August.
- **Encourage early fruit retention.** Don't misuse glyphosate in RR systems. Apply mepiquat (Pix, etc.) to increase square and boll retention and tilt the crop towards reproductive rather than vegetative growth. Scout carefully and spray as needed to minimize insect losses.
- **Be prepared to aggressively apply harvest aids as the crop matures.** Once the crop nears 60 percent open and/or 5 nodes above cracked boll, it is ready. Treat with defoliant and boll opener combinations, and then pick as soon as the leaves drop.

There are risks associated with an “Earliness” Management system. Each involves adverse weather.

Of the concerns, early planting ranks as a far lower risk than early harvest. On the front end, planting in mid-April can sometimes mean increased problems with stand establishment because of cool temperatures and wet soils. Our standard recommendation is, “Planting can safely proceed when the 4-inch soil temperatures reach 65° F for 3 days and warming conditions are projected over the next several days.” This is a very conservative approach and provides a more than reasonable margin of safety. Other, more northerly states routinely plant under much more adverse conditions and consistently achieve acceptable stands, though often at higher seeding rates. Conditions in south Georgia in mid-April are usually suitable for stand establishment. Use common sense. Consider temperatures; look at forecasts.

A second risk is a June drought. If the crop speeds ahead and blooms by June 20, dry weather in late June can be devastating, especially for early maturing varieties in non-irrigated fields. Keep in mind that mid to full maturing varieties generally have greater “comeback” potential and can more readily recover from periodic drought.

Historical averages indicate the likelihood of significant rainfall around Labor Day. This motivated UGA scientists in the past to recommend that cotton planted be delayed until after May 10 to avoid or minimize boll opening during this time. If boll opening initiates during a period of rain, high humidity, and overcast conditions, problems with boll rot increase. While averages suggest a greater threat of rain in early September versus late September and October, no one can accurately predict what will happen this year. Delays in recommended peanut planting dates have pushed peanut harvest back closer to October 1; thus, there is a window in September to harvest cotton. Again, the risk of rain in early September exists. An equal or even greater risk is cotton that fully opens in late September and remains in the field for weeks while attention is diverted to peanuts.

Even with the risks, the opportunity and possibility of harvesting cotton in early to mid-September is an option that should be considered on many farms.

CONTROL WEEDS EARLY OR LOSE MONEY! (*Culpepper and York*). Roundup Ready cotton is widely planted across the cotton belt, especially in the Southeast. Growers love the broad spectrum weed control offered by Roundup (glyphosate, many brands) and the ease of application. Unfortunately, many growers may not be timely enough with their initial postemergence application to avoid yield loss to weed competition. Whether growers are intentionally delaying application to allow a few more weeds to emerge before treatment or whether delayed application is due to weather or equipment limitations, failure to control weeds timely can be expensive.

Research conducted three decades ago showed that cotton can tolerate weeds for a short period after planting and that it can tolerate weeds emerging later in the season. However, weeds must be controlled during the period from about 3 to 8 weeks after planting. Cotton production and

weed management practices have certainly changed over the years but impacts from early season weed competition have not changed.

There are basically two early season weed control programs used by Roundup Ready cotton growers. Some growers use a preemergence herbicide and follow with an application of Roundup or a Roundup mixture overtop of three- to four-leaf cotton. If the preemergence herbicide is activated by rainfall or irrigation and the herbicide is effective on weeds present in the field, growers can usually delay Roundup application until cotton reaches 3 to 4 leaves without suffering yield loss.

Many growers forgo the preemergence herbicide and depend entirely upon Roundup for early season weed control. Except for fields with Florida pusley, this program can work well. However, most fields will require two applications of Roundup prior to five-leaf cotton. Growers who rely on a single application of Roundup to 3- to 4-leaf cotton in the absence of a preemergence herbicide are likely losing yield. Even though they may be able to clean up the weeds well, the cotton may have already suffered from weed competition (Table 1). Similar results can be expected with Liberty Link cotton (Table 2).

Results presented in the tables are really nothing new, but they do confirm what has been observed in a number of other experiments. It is particularly interesting to note the short amount of time necessary for weeds to adversely impact yield. Early season weed competition that occurred for only 9 to 10 days between 1- and 4-leaf cotton reduced yields 24 to 32% (Tables 1 and 2).

Table 1. Roundup Ready cotton yield response to early season weed competition in Georgia in 2004.*

Pre-emergence herbicide	Cotton stage at 1 st Roundup application	Date of 1st Roundup application	Seed cotton yield (lb/A)
None	1-leaf	June 6	3714
None	4-leaf	June 15	2816 (-24%)
Prowl	4-leaf	June 15	3584
*After initial Roundup application, weeds were removed for the remainder of the season before they exceeded 1.5 inches tall.			

Table 2. Liberty Link cotton yield response to early season weed competition in North Carolina.*

Pre-emergence	Cotton stage at 1 st Ignite application		Date of 1 st Ignite application		Lint yield (lb/A)	
	2003	2004	2003	2004	2003	2004
None	1-leaf	1-leaf	June 2	June 2	875	1080
None	4-leaf	4-leaf	June 12	June 11	615 (-30%)	730 (-32%)
Prowl	4-leaf	4-leaf	June 12	June 11	900	1080

*After initial Ignite application, weeds were removed for the remainder of the season before they exceeded 1.5 inches tall.

ENVOKE/STAPLE MIXTURES LABELED FOR GEORGIA COTTON. (*Culpepper*). A section 2(ee) label for Georgia now allows cotton growers to apply Envoke at 0.1 to 0.15 oz of product per acre in mixture with Staple at 0.6 to 0.9 oz of product per acre for the control of smallflower morningglory.

Georgia research, for many years, has shown that 0.1 oz/A of Envoke plus 0.6 oz/A of Staple is an effective combination to control many broadleaf weeds and will provide postemergence and residual control (if Staple herbicide reaches soil and is activated) of smallflower morningglory. These lower use rates are adequate except in salvage situations where rates may be increased according to the label.

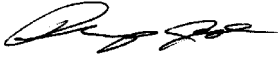
This mixture can be applied over-the-top or directed to cotton that has reached a minimum of 5 true leaves.

This application should be made in a minimum of 10 gallons of water per acre and a non-ionic surfactant at 0.25% v/v should always be included.

As is the case with Envoke or Staple applied alone, topical applications of Envoke plus Staple can occasionally result in yellowing of leaves and shortening of cotton internodes. Avoid treating stressed cotton such as the following: wet or cool growing conditions or cotton injured from thrips, wind, or sandblasting.

UPDATES TO COTTON WEB PAGE (*Jost*) Finally, the 2003 version of the Cotton Research and Extension Report has been posted to the cotton web page (a year late is better than never!) The 2004 edition will be posted in the near future. Also, the cotton web page can still be accessed via the old URL or with the newer easier to remember ugacotton.com.

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