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

Georgia Cotton

July 5, 2011 www.ugacotton.com

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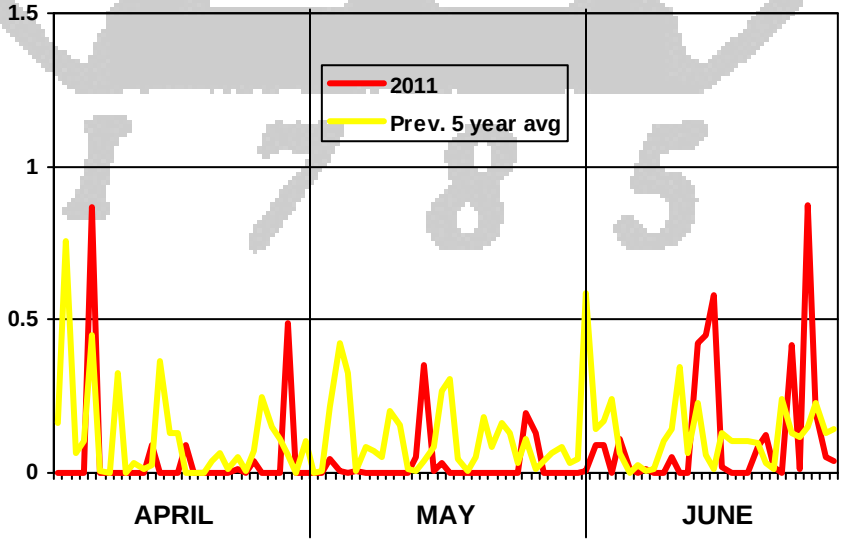
Current Crop Status (*Collins and Whitaker*)

I think that most would agree that this has been a very difficult year for stand establishment and early season growth. As dry weather persisted through the end of our planting window (which generally ends around June 10th – June 15th) in most places, many growers were forced to replant multiple times throughout our planting window in hopes to achieve an adequate stand. Rainfall events that did occur, although few and far between, were generally small and insufficient for wetting the soil profile to depths necessary to sustain soil moisture for any appreciable length of time. These rain events were also generally followed by several days of dry weather causing rapid depletion of available soil moisture for emergence (Figure 1).

Figure 1. Average rainfall (inches) for 11 locations (Attapulgus, Moultrie, Camilla, Tifton, Plains, Vienna, Douglas, McRae, Vidalia, Statesboro, Midville) across Georgia in 2011 compared to the average of 2006-2010 for these same locations



In these cases, most seed experienced enough moisture to germinate but this moisture diminished before seedlings were fully emerged. In normal years, growers observe natural differences in cultivar vigor and emergence rates, but seldom does it translate into stand establishment nor yields. This year was quite different. Due to the rapid depletion of soil moisture, less vigorous varieties (and / or ones that tend to emerge slower than others) may have resulted in poorer stands than other varieties, provided that seed was planted in decent moisture and at appropriate depths. In some cases, stand establishment was difficult for any variety. Irrigation resulted in much better stands compared to dryland fields this year (Figure 2) however these fields often had their own share of challenges. Even in irrigated fields, rapid moisture depletion was observed, requiring multiple water applications for the crop to fully emerge. In these cases, severe herbicide injury was not uncommon. Stunting and slow growth often resulted, however in most cases, a stand was established and seedlings grew out of the injury after some time.

Figure 2. Better stands were often observed in irrigated fields where pivots reached compared to dryland fields in 2011.

Recent rains since mid June have improved growth of much of the crop, however the effects of the dry spring weather have likely had lasting effects on crop growth for those that were able to achieve an acceptable stand. The lasting effects on growth of the crop that was planted towards the end of our planting window (late May or first 2 weeks of June) are unclear at this point (provided that an acceptable stand was achieved), however these effects are becoming more pronounced on cotton planted in late April or early May. Cotton that was planted in late April or early May is now beginning to bloom, and in many cases is shorter than normal to be blooming. Several irrigated fields (but not all) contain only knee-high cotton that is beginning to bloom with only 7 or less nodes above white flower (NAWF) (Figure 3). This is a strong indicator of pre-bloom stress, despite the fact that these are irrigated fields. Healthy cotton should ideally (but not always) begin blooming at approximately 25 inches tall with 9 to 10 NAWF (see our comments regarding NAWF from the July 2010 newsletter below). Even though many irrigated fields in 2011 are entering the bloom period with insufficient plant height and NAWF, there is still hope for these fields. PGR applications are <u>not needed at this point for these situations</u>, as a PGR application will only further slow terminal growth allowing the developing boll load to

restrain terminal growth which will lead to a premature cutout and suboptimal final plant height. At this point in time, these situations could benefit from frequent irrigations / rain which could somewhat revive terminal growth as the bloom period progresses.

Figure 3. Some irrigated fields of cotton planted in late April or early May are showing signs of prebloom stress (shorter than normal plants with 7 or less NAWF).

The earlier planted (late April or early May) dryland crop is in worse shape at this point. Many of these fields (but not all) have already reached cutout, or will very soon (Figure 4). This is not a good sign, and the final outcome of these fields is unpredictable. The only thing that could improve these fields is adequate and frequent rainfall from this point forward. The boll load in these situations is very small which may not restrain the revival of growth of these plants to the extent that a larger boll load would, however all flexibility is lost. Acceptable yields are still achievable (although highly unlikely given that these are dryland fields) in these situations…….remember what we observed in SW Georgia last year: while 2010 was not the same situation as we are experiencing this year, many fields had 300 lbs/A yield potential on August 1, 2010, but the frequent August rains revived terminal growth and upper boll development allowing much higher yields to be achieved. However, rains were adequate and frequent during this period of 2010. We will have to have sufficient season-long moisture with no dry spells to revive these dryland fields, and even then, acceptable yields may be very unlikely.

Figure 4. Some dryland fields of cotton planted in late April or early May have already reached cutout due to severe prebloom drought stress).

From the July 2010 newsletter…..

Nodes above white flower and fruit load throughout the bloom period: The number of nodes above a first position white flower (NAWF) should be around 9 to 10 at first bloom (14 to 16 total plant nodes) in healthy, vigorously growing cotton and 7 to 8 at peak bloom (2 to 3 weeks after first bloom). This number should gradually decrease throughout the bloom period until the cessation of fruiting. Usually, terminal growth slows as NAWF decreases and a boll load accumulates. If NAWF is significantly less than 9 or 10 at 1st bloom (7 or less), then this could be an indicator of some sort of stress (primarily drought) which occurred prior to bloom. This could also be a result of prior PGR treatments, thus a PGR application may not be necessary, especially in dryland fields. If NAWF is 9 to 10 or greater at first bloom, a PGR application may be justified if soil moisture is sufficient and there are no signs of current drought stress.

Buyout of Bale Contracts *(Shurley)*

Cotton prices have been very attractive (above $1.00 per pound) for 2 years—last year's crop and again this season. Prices have been high but also very volatile due to US and global economic uncertainty.

To manage price risk, farmers often choose to price (contract) a portion of their expected production prior to harvest- sometimes even prior to planting the crop. Contracting provides a fixed price on the number of bales contracted.

While this reduces price uncertainty, it creates its own separate risk because (a) prices may increase after the contract and a potentially higher price is foregone on the bales contracted and (b) the farmer is contractually obligated to deliver the number of bales specified by the contract. Because contracting is done sometimes months before harvest or even prior to planting and because yield depends on the weather, there is always a risk of not being able to deliver on the contract if the contract represents a large proportion of the expected crop.

Because of this year's drought, some farmers believe they will not be able to deliver the number of bales already contracted. Some cotton has been planted in very dry soil conditions, some has been planted late waiting on rain, some has been replanted due to poor emergence, and some farmers have even planted additional acres in hopes of being able to make the production needed to deliver the bales contracted.

Typically, the farmer (seller) is obligated to deliver the number of bales contracted regardless of the circumstances. This is especially the case if prices have increased since the contract because the buyer has taken a position in the futures market to offset the cash obligation of the contract and stands to lose considerable money if the physical cotton is not delivered. If prices have declined since the contract, however, the buyer will typically let the farmer out of the contract (not hold the farmer to deliver the number of bales) because the buyer will likely be able to find another farmer willing to sell and deliver at the higher contract price.

If the farmer believes he/she is unable to deliver on a contract, the contract can be "bought out" or the buyer can "unwind" the contract. Suppose the farmer contracted 500 bales in January for 97 cents/lb ($1.00 December 2011 futures minus 3 cents basis). The farmer, however, believes he/she will only be able to deliver 300 bales. If December futures are currently at $1.19/lb, the difference between the contract and now is 19 cents/lb ($1.19 minus $1.00). The difference between the contract and what can be delivered is 200 bales. The farmer can "buyout" on the 200 bales for $19,000 ($0.19/lb futures difference x 200 bales x 500 lbs/bale).

Why would the farmer (seller) want to do this? First of all, the farmer is obligated for the bales contracted, and if short, would otherwise have to pay the difference at the time of delivery. If prices are currently above the contract and should prices continue to go even higher, the penalty paid at harvest will be higher than the current buyout. It is cheaper to buyout now.

Why would the farmer not want to do this? Paying the difference can be difficult. No one knows what prices will do. Prices could move lower, in which case the buyer may not hold the farmer to the contract. Production is also unknown. The crop could do better than expected and the farmer may be able to deliver the bales contracted.

Making the buyout decision depends on (1) the contract price, (2) the current price, (3) the farmer (sellers) opinion whether prices at delivery will be higher or lower than the contract price, and (4) the farmers opinion of the chances of making full delivery on the contract.

If the farmer believes prices will remain above the contract price and perhaps go even higher, there is no advantage to not doing a buyout. It will be cheaper to pay the difference now rather than in the future and, if production ends up better than expected, those un-contracted bales could be priced at the higher price.

Cotton is currently over $1.00/lb and has been over $1.00 since around the first of the year. Some farmers could have cotton contracted at $1.00 or less. Prices at harvest (delivery time) would have to retreat to less than the contract price, otherwise the farmer will very likely be held

to the contract. If deciding to forgo a buyout, the farmer would be risking that he/she will be able to deliver on the contract and/or that the market will be below the contract.

Prices (December 2011 futures) have recently trended down from around $1.40/lb to less than $1.20. As prices have declined, this has reduced the cost of a bale buyout. For farmers considering a buyout, the cost of the buyout has declined significantly. On the other hand, this downtrend, should prices continue downward, may cause some farmers to hold on to their contract and hope even more to make the bales. From a production standpoint, you want to have more confidence you can make the crop before doing a buyout-- but unfortunately, that extra time could result in buyers less willing to do the buyout.

If a production shortfall is expected (likely) and the farmer is considering a buyout, the farmer (seller) should discuss this with the buyer as soon as possible. The sooner the situation can be discussed, the more likely the buyer will agree to a buyout. Most buyers would rather deal with a buyout sooner rather than later. If the farmer waits until later in the season, the buyer may be less agreeable to a buyout.

Rolling the Bales

Rather than a buyout, the farmer may also have the option of rolling (deferring) those bales to the 2012 crop. If December 2011 futures are at $1.19, for example, and December 2012 futures are at $0.98, the difference is $0.21. Rolling to 2012 would mean that the farmer would have a contract on those bales for $0.77 (Dec2012 at $0.98 minus the $0.21 difference) less the basis. This seems like a less attractive alternative.

How to Fertilize Late-Planted Cotton and Uneven Stands (*Harris*)

Due to the extreme and exceptional drought in south Georgia, we have a lot of late-planted June cotton and fields with uneven stands this year. Some key points to remember when adjusting to this situation are:

1) **Don't try to rush the crop by overfertilizing with nitrogen** – Unfortunately you can not fertilize your way out of a drought. I wish you could. And in fact, trying to rush a late-planted crop with extra N can actually backfire and delay maturity making matters even worse. Go with conservative sidedress N rates on dryland (50 to 60 lb N/a depending on how much preplant N was applied) according to yield goals. If the rain situation improves as the crop progresses, you can always make up some ground with foliar (up to 20 lb N/a if you use feed grade urea and are willing to foliar feed more than once).

2) **Apply sidedress N on the early side** – The normal 'window" for sidedressing N is from first square to first bloom. For late planted cotton, especially dryland, you may want to hedge more toward first square than first bloom. Unfortunately, many preplant N applications were skipped and sidedress N is the first N fertilizer the cotton plant is receiving. Again, be cautious of applying too much N to late-planted cotton too early.

While it is true that most new cotton varieties fruit up earlier, and it makes sense they would need N earlier, there is also the strong possibility that you could interfere with the plant wanting to shift from vegetative mode to reproductive mode, that is, making it want to keep growing stalk instead of shifting to putting on bolls. On late-planted cotton you have less time to make the crop and usually can not afford this delay.

3) **On uneven stands, fertilize to the majority and hopefully the oldest** – I've seen a lot of fields, again dryland, where some cotton had enough moisture to come up early, but then another "flush" came up much later. It is not uncommon to have cotton plants that are near first square and others that have just emerged in the same field. The rule of thumb should be to time your sidedress N application according to which stage you have the most of in the field. This recommendation is easy to follow when you have mostly older ('first square") cotton, but is much trickier when you have "half and half", especially if the "tall" cotton and "short" cotton are randomly mixed together and not in large patches. The only danger of sidedressing really young cotton is if you use liquid N and dribble a full rate directly on top or into the terminal. There is also a possibility of you sidedressing N close to very young cotton (2 to 3-leaf) and if it turns dry, you could get some salt injury.

4) **Foliar N and K can help "get you through" (but not "do it all") –** Foliar feeding N and K should always be seen as a way to supplement a good soil applied fertilizer program. In times of limited soil moisture, it can be a good way to 'tie you over" and get some nutrients into the plant when the plant may be struggling to take up nutrients through the roots. We have seen this (especially with K) on Georgia cotton before, where soil K levels are adequate but due to dry soil conditions, the plant goes almost K deficient during droughts. There are limits of course and it is not recommended to foliar feed anything if the crop is drought stressed to the point where it is "wilted by noon". Also, it may be tempting to try to foliar feed N instead of sidedress until you see you have some true yield potential on drought-stressed dryland. However, this is not recommended. If a dryland crop is ready to sidedress i.e. at first square, I would recommend sidedressing N over foliar feeding.

<u>Opportunities for Disease and Nematode Management in July</u> (*Kemerait*)

Opportunities for management of plant parasitic nematodes and diseases affecting cotton in Georgia are typically few and far between in July. Such is the case both because there have not been many diseases of importance during this time and because there has been little that can be done for those diseases (and nematodes) that take yield away from the grower.

Stemphylium leaf spot (pictured below) can be very severe in some fields and is quite likely to be an issue in 2011 because of the extreme hot and dry conditions experienced early in the season. Where this disease has developed in the past (e.g. in sandy areas of a field) it is likely to develop once again. A deficiency of potassium in the leaf tissue (for any number of reasons) makes the leaves much more susceptible to attack from this fungal pathogen. Many growers first

see symptoms of Stemphylium leaf spot during the month of July. Use of fungicides such as Headline and Quadris within the first few weeks of bloom have been of minimal success in limiting the development of this disease; effective management requires that the cotton foliage is supplied with sufficient amounts of potassium during the growing season. Hence, management of Stemphylium leaf spot falls primarily to Dr. Glen Harris and into the realm of soil fertility and crop nutrition.

Figure 1. Stemphylium leaf spot; note "shot-hole" appearance and small spots encircled by dark margins.

Although research on Corynespora leaf spot (Figure 2) is quite limited in Georgia, it does appear that this disease is unrelated to a nutritional deficiency and significant defoliation during the second half of the season can occur as a result of this disease. Research continues to assess the management of Corynespora leaf spot with fungicides; however in studies conducted in 2010 in southern Georgia, severity of the disease was reduced with the use of a single application of Headline (6.0 fl oz/A). Yield in a large, on-farm study conducted by R.J. Byrne in Thomas County was increased by more than 60 lb of lint/A in treated versus untreated plots.

Admittedly, use of a fungicide like Headline on cotton to protect against a disease such as Corynespora leaf spot requires further effort to more clearly understand where the practice can be done with a reasonable chance for success. At this point, I am confident that a well-timed

application Headline (and likely other fungicides) can improve yields and value to those growers who have fields where this disease is a problem. Most of the fields where we have found significant outbreaks of Corynespora leaf spot have been in the southwestern region of the state. Growers I feel most likely to benefit from use of a foliar-applied fungicide are those who have a) observed (or think they have observed) the disease in the past, b) plant cotton on a short rotation, and c) have a cotton crop with dense foliage and good yield potential. "Best" timing of a fungicide application remains elusive; however an initial application 2-4 weeks beyond first bloom, especially with approach of a tropical storm system, have been our target so far. Defoliation in untreated plots can be three times greater than in treated plots with as much as five weeks to go before the need for anticipated defoliation.

Figure 2. Corynespora leaf spot; note larger size of spots and presence of "target" rings.

As the cotton crop moves into July, symptoms of the damage by plant-parasitic nematodes to the root systems of the cotton plants can become quite evident, especially where attack by nematodes is coupled with infection by *Fusarium oxysporum* causing Fusarium wilt (Figures 3 and 4). If the cotton crop has not yet reached the "pinhead-square" growth stage, there is the opportunity for growers with access to Temik 15G to sidedress the crop at 5-6 lb/A. However, at pinhead-square and beyond, the potential for damage to the expanding root system as the Temik

is knifed into the soil, becomes more important than does the benefit from the use of the nematicide.

Figure 3. Young cotton plant in Berrien County affected by Fusarium wilt and sting nematodes. Note the interveinal chlorosis and stunting.

Figure 4. Note darkening of vascular tissue where cotton plants are affected by Fusarium Wilt.

<u>Effect of Cleaning at the UGA Microgin on Fiber and Yarn Quality: I</u> (*Li, Knowlton, Thibodeaux, and Foulk*)

Cleaning during the ginning process significantly affects fiber quality properties like fiber length and trash. Under-cleaning could lead to excessive trash and potential price penalization to cotton growers, while over-cleaning could lower cotton fiber quality such as creating short fibers. To achieve the maximum profitability, ginners must preserve the quality of cotton fiber while removing as much trash from the lint as possible when they set up their ginning procedures. Therefore, it is important to understand how cleaning during the ginning process affects the fiber quality, a primary concern for ginners.

A detailed investigation was conducted by UGA researchers and USDA scientists to evaluate the effect of cleaning treatments via the UGA microgin on fiber quality. By varying seed cotton cleaners and a saw-type lint cleaner (Table 1), this study provides insight into how individual cleaning process affects the fiber and yarn quality. The information could be used to optimize the ginning setup that minimizes fiber damage and ensures adequate trash removal in the microgin.

Table 1. Six cleaning treatments used in the microgin

	Seed cotton cleaner 1	Seed cotton cleaner 2	Saw type lint cleaner
Treatment 1	Used	Used	Used
Treatment 2	Used	Used	Bypassed
Treatment 3	Used	Bypassed	Used
Treatment 4	Bypassed	Used	Used
Treatment 5	Used	Bypassed	Bypassed
Treatment 6	Bypassed	Used	Bypassed

All cotton samples were harvested by a spindle cotton harvester in a commercial farm in Colquitt County, Georgia in October and November in 2009. Cotton samples were grown in one irrigated field with similar growing conditions. A total of 54 cotton samples were used. Cotton fiber quality was measured via HVI™ and AFIS at the Cotton Fiber Quality Research Station of the USDA ARS in Clemson.

HVI™ data

HVI™ trash count results appear to reveal that cotton lint ginned by treatments 2, 5, and 6 demonstrated significantly higher trash counts than that ginned by treatments 1, 3, and 4 (Table 2). The differences are likely due to the fact that the first group (treatments 2, 5, and 6) bypassed the saw-type lint cleaner. The lint cleaner appears to be more effective than the seed cotton cleaner in reducing trash level in cotton. The leaf grade generally reflected a similar pattern as trash count, although the distinction among treatments was less obvious. On average, leaf grade in treatments 2, 5, and 6 was higher than that in treatment 1, 3, and 4. However, only the leaf grade from treatment 5 (with the highest leaf grade) was significantly higher than that from treatment 1 and 4 ($P<0.05$), while treatments 1, 2, 3, 4, and 6 were not significantly different.

Two HVI™ length properties were examined: upper half mean (UHM) length and length uniformity (UNIF). In general, lint ginned by treatments 2, 5, and 6 had higher UHM than that by treatments 1, 3, and 4. The cotton lint ginned by treatment 5 which experienced the least mechanical processes had the longest fiber length, significantly higher than that from treatments 1, 3, and 4 (all three had lint cleaner). There was a clear pattern in length uniformity across six treatments with treatments 2, 5, and 6 having significantly higher length uniformity values than treatments 1, 3, and 4. The results are consistent with cotton trash measurement and confirmed that lint cleaning reduces length uniformity and length more than seed cotton cleaning.

Table 2: ANOVA test of HVI™ cotton fiber quality in trash level and fiber length in comparison of six cleaning treatments.

	Trash count (au)	Leaf grade (au)	UHM (in.)	UNIF (%)
Clearning treatment				
1	33.78 c[1]	2.78 b	1.118 c	82.53 b
2	47.78 ab	3.56 ab	1.131 ab	83.17 a
3	39.89 bc	3.22 ab	1.119 c	82.54 b
4	34.44 c	2.89 b	1.119 bc	82.34 b
5	52.44 a	3.78 a	1.135 a	83.36 a
6	43.67 b	3.33 ab	1.127 abc	83.36 a
LSD	8.64	0.82	0.012	0.54

1. Same lower case letters indicate no significant difference between treatments (P=0.05).
2. Same upper case letters indicate no significant difference between cotton varieties.
3. No letters indicate no significant difference across treatments or varieties.

AFIS data

Results of visible foreign matter (VFM) generated via the AFIS demonstrated that treatments 5 and 6 (bypassing the lint cleaner and one of seed cotton cleaners) had significantly higher VFM

than treatments 1 (fully ginned) and 2 (without lint cleaner) (Table 3). In "total trash count", another trash level measurement from the AFIS, cotton ginned by treatments 5 and 6 had significantly higher trash count values than that ginned by treatments 1, 2, 3, and 4. The AFIS data suggest that bypassing only one of seed cotton cleaners or the saw-type lint cleaner does not significantly affect the trash count compared to the full ginning process. As for the fiber length measurement, none of the four length properties exhibited significant differences across six treatments. As far as neps are concerned, lint ginned by treatments 1, 3, and 4 had significantly higher neps than that ginned by treatments 2, 5, and 6. These results suggest that more neps are likely to be created with additional seed cotton and lint cleaning.

Table 3. ANOVA tests of AFIS cotton quality properties in trash level, fiber length, and neps in comparison of six cleaning treatments.

	Total count/g	VFM %	SFC (w) %	SFC (n) %	L (w) (inch)	L (n) (inch)	Neps per Gm
Cleaning Treatments							
1	420.22 b[1]	1.68 c	8.32	23.83	0.99	0.81	206.11 a
2	510.89 b	1.82 c	8.46	24.32	0.99	0.81	171.22 b
3	474.67 b	1.91 bc	8.52	24.58	0.99	0.81	203.89 a
4	446.67 b	2.03 bc	8.50	24.39	0.99	0.80	200.78 a
5	695.67 a	2.52 ab	8.10	23.86	1.00	0.82	158.56 b
6	702.00 a	2.72 a	8.28	23.94	1.00	0.82	168.11 b
LSD	126.85	0.69	1.09	2.72	0.0178	0.03	25.95

1. Same lower case letters indicate no significant difference between treatments (P=0.05).
2. Same upper case letters indicate no significant difference between cotton varieties.
3. No letters indicate no significant difference across treatments or varieties.

Results from this study demonstrated that the six cleaning treatments significantly impacted trash content and neps more than fiber length and length uniformity. Ginning without the saw-type lint cleaner was more likely to create lint with higher trash content and lower short fiber content. However, ginning without one of seed cotton cleaners did not appear to affect cotton trash and length and this cleaning option should be considered to reduce fiber damage and save energy.

Upcoming Field Days:

SE Research & Education Center Field Day, August 16, 2011, Midville:
Contact Anthony Black at 478-589-7472 for information. A detailed schedule of speakers and registration information will be forthcoming.

Stripling Irrigation Research Park Field Day, July 19, 2011, Camilla: Everyone is invited to the annual Stripling Irrigation Park Field Day scheduled for July 19, 2011. The day begins with registration at 8:30am followed by tours of research and demonstrations ongoing at the Park, ending with a sponsored lunch. A full agenda with speakers will be forthcoming. We recommend that you pre-register by contacting Candace Gray at Stripling Park at 229-522-3623 or sirp@uga.edu.

Cotton & Peanut Research Field Day, September 7, 2011 Tifton: Mark your calendars for the 4th Annual UGA Cotton and Peanut Research Field Day scheduled for September 7, 2011. The tour will begin at 9:00 a.m. and conclude with lunch; a detailed schedule of speakers and registration information will be forthcoming. The field day is being sponsored by the Georgia Cotton Commission and the Georgia Peanut Commission.

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

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