UNIVERSITY OF GEORGIA EXTENSION

UGA Cotton Team Newsletter
July 2024

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Georgia Cotton Commission Mid-Year Meeting – July 24, 2024 (*Camp Hand*): This entry in the newsletter is a reminder that of the Georgia Cotton Commission Mid-Year Meeting, scheduled for July 24, 2024 at the Nessmith-Lane Conference Center on the campus of Georgia Southern University in Statesboro, GA. The Georgia Cotton Commission has put together a great program featuring updates from the Georgia Cotton Commission, UGA Extension, The Cotton Board, The National Cotton Council, and Georgia Department of Natural Resources. We will also present the Georgia Quality Cotton Awards during lunch. A full agenda can be found here. We hope that you all will attend, and if you plan to, you can register at this link.

Many of you participated in the deer survey that I distributed last winter during county meetings to determine the severity of the deer issue on cotton in our state. At this meeting, a couple of my graduate students and I will be collecting more data on the impacts of white-tailed deer on cotton farmers in our state, outside of just the yield loss and management costs associated with them. I hope that you all will come and participate in this new effort we are partnering with Anna Scheyett on.

As always, if you have questions on this event or anything else, please don't hesitate to reach out to your local UGA County Extension Agent or the Georgia Cotton Commission.

Sidedressing June Planted Cotton, Foliar Feeding, and Urease Inhibitors (*Glen Harris*): The rains in May in South Georgia seem to have created a bit of a "split crop". So, we have both May-planted cotton that is about to bloom and June-planted cotton that is yet to square.

For June-planted cotton it is important to remember not to try to catch up with a high N rate early. It seems backwards because you feel the need to "speed up" the crop. But this can actually backfire since if

you get too much vegetative growth early and the plant doesn't shift to reproductive growth on time you will lose yield potential. In other words, there is not as much time to fruit and put on bolls when planting in late June and you don't want to delay fruiting.

Also, don't forget that if you come up a little short on N later in the year for May or June planted cotton, you can also do some foliar feeding, especially anytime between the 3rd and 6th week of bloom. The beauty of foliar feeding N on June-planted cotton during "peak bloom" (first 4 weeks of bloom) is that foliar feeding N does not cause any vegetative or "rank" growth. Basically, the N goes right into the leaf, through the petiole and into the bolls. Research studies have indicated this can all happen in about 24 hours' time!

As far as potassium, regardless if the cotton was planted in May or June, soil applying all the recommended K at planting is recommended. With all the rain in May this year there has been a lot of concern with leaching of potassium and questions about replacing it at sidedress time with N. The thing to remember is that K is not as mobile or as "leachable" as N in soil. Phosphorous (P) is very immobile so yes, compared to P it is mobile. But compared to N, K is not as mobile. What does this mean in practical terms? I do believe the "big rains" in May likely moved K down deeper into the soil profile. But I believe the cotton roots will eventually get down to those levels and recover it. On the other hand, the wet, saturated soil may have also comprised the cotton root system, that is the roots may not be as deep and robust due to the wet conditions. In this case there may be some benefit from adding some sidedress K when you sidedress N. Unfortunately, this is easier to do with granular materials like KMag and muriate of potash than "liquid K" …it's hard to get a decent shot of K per acre when adding liquid K to liquid N sidedress.

Many Georgia cotton growers actually plan on split applications of K. But there are multiple ways to split it. For example, if you put all your recommended K out at planting and then put some "extra" in at sidedress that certainly is not going to hurt anything. And in a year like this year, which is not normal (is there even such thing as a "normal" year anymore?) spreading some KMag or muriate of potash at sidedress with your N may not be a bad idea at all. And finally, if we get into the peak bloom period and start seeing a lot of K deficiency and leafspot (and I suspect we will) we can also do some foliar feeding of K. And if you need both N and K they can be foliar fed together.

After the May rains, it dried off considerably and questions rolled in about using urease inhibitors on urea sidedress to prevent volatilization loss of N. The key here to remember is that the volatilization process requires some soil moisture to go. The worst-case scenario is that you topdress with granular urea and have some soil moisture, then you dry out and it gets hot and windy. Unfortunately, this describes a lot of Georgia cotton acres in June, especially dryland fields. Urease inhibitors are designed to "hod on" to the N for approximately 10-14 days. Worst case scenario you dry out after that and may lose 20 % of your sidedress N. This is a really hard number to confirm and is just an estimate. In fact, I would guess that across the board, losses from volatilization of urea are more in the order of 5- 10 % of what you applied.

Cotton Aphid Management (*Phillip Roberts*): Cotton aphid is a consistent and mostly predictable pest of cotton in Georgia. Aphid populations have been slow to build in 2024 but infestations have increased

significantly in the last 7 to 10 days (the reproductive potential of aphids is amazing). Aphids feed on plant juices and secrete large amounts of "honeydew", a sugary liquid. The loss of moisture and nutrients by the plants can have an adverse effect on growth and development. This stress factor can be reduced with the use of an aphid insecticide. However, research conducted in Georgia fails to consistently demonstrate a positive yield response to controlling aphids. Invariably, some fields would likely benefit from an aphid insecticide application during some years. Factors to consider when deciding about spraying aphids include general plant health and the environment. We would expect yellowing of terminal growth or lower leaves, reduced plant vigor, high amounts of honeydew, and drought stress or combinations of these to increase the likelihood of seeing a yield response to treatment. Before treating aphids, be sure there is no indication of the naturally occurring fungus in the field or immediate vicinity.

Aphids will continue to increase populations and will eventually crash due to the naturally occurring fungus, *Neozygites fresenii*. This fungal epizootic typically occurs in early to mid-July depending on location. Once the aphid fungus is detected in a field (gray fuzzy aphid cadavers) we would expect the aphid population to crash within a week. Typically, the fungus starts in the southernmost counties of southwest Georgia and moves north and east in time.

We have received several questions on performance of aphid insecticides. In 2019 and 2020 entomologist across the southeast evaluated numerous insecticides for aphid control. In general, the most consistent performers for aphid control included Transform and Assail. Carbine also performed well but is slower acting compared with Transform and Assail. Centric, Admire Pro, and Bidrin are also recommended for aphid control but tend to be less consistent in performance but typically will remove associated plant stress from high aphid infestations.

A closer look at a cotton aphid infested leaves and identification of the cotton aphid fungus (*Neozygites fresenii*) and other interesting things:

Figure 1. Cotton aphid fungus present and aphids are crashing. Note the gray fuzzy aphids which is indicative of the fungus. Also note the aphid cast skins which are white in color; aphids molt or shed their exoskeleton (skin) as they grow.

Figure 2. Zoomed in on a fungus killed winged aphid. See the fungal growth and sporulation.

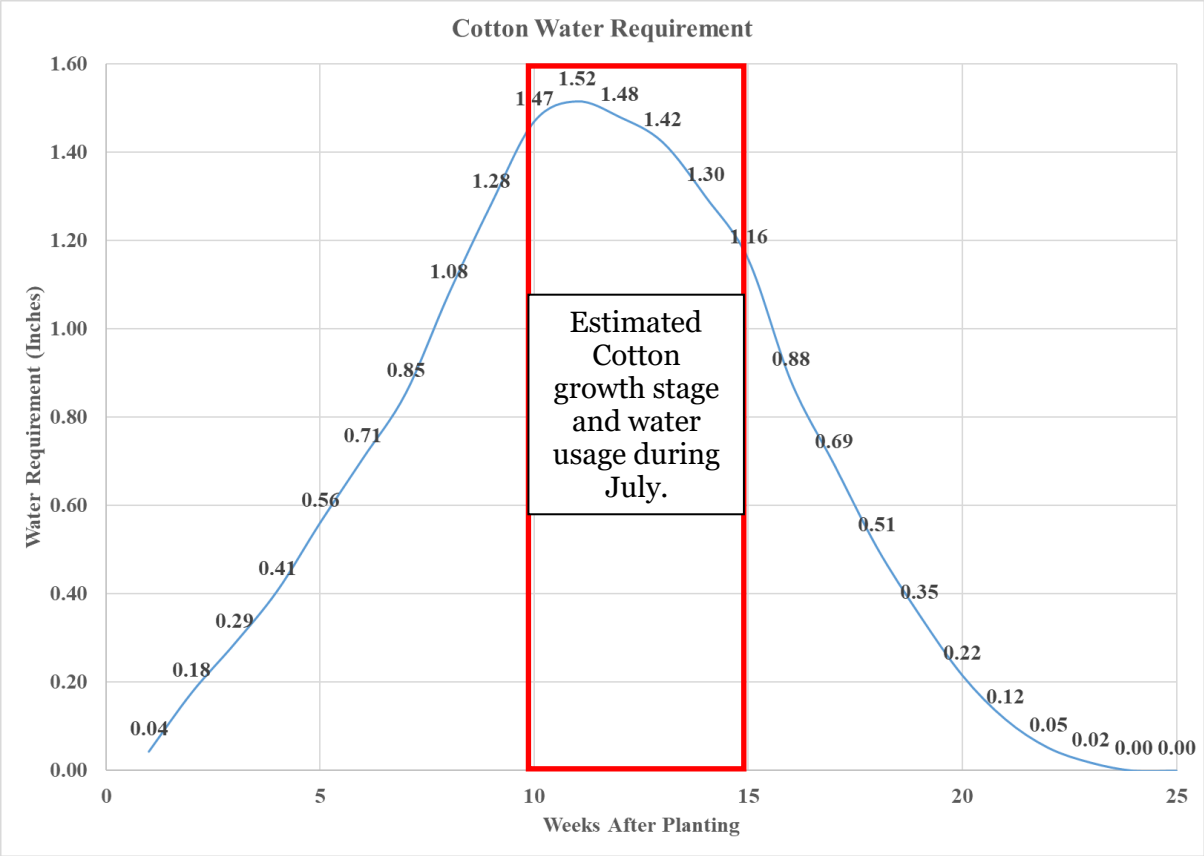
Figure 3. No fungus in this infested terminal. The brown balls (aphid mummies) are aphids which have been parasitized by a small wasp. Also, lots of aphid cast skins in this pic.

July Mid-Season Cotton Irrigation Considerations (*Jason Mallard, David Hall, Phillip Edwards, Daniel Lyon, and Wesley Porter*): Every year brings a significant challenge. We were cooler and wet throughout the early part of the 2024 season, June brought the lack of rain and heat especially later in the month. The early rain, however, prevented many growers from finishing a timely and stretched planting into June when the weather became hot and dry. It has turned very hot, and while we have started to get sporadic rain showers across the state, many growers and fields have missed these showers and have remained very dry (the long-term forecast has temperatures staying in the upper 90's). While the cooler weather and rainfall are always welcome and appreciated, it kept some of our younger crops, specifically, cotton and peanut, in saturated conditions through most of May and early June and very likely hindered deep rooting development. Now that we are hot and dry and are moving into peak water demand for cotton and peanut, we need to ensure we are staying on top of our irrigation requirements. Since we may not have as deep of a rooting system, we may need irrigation more frequently than we typically do. One tool to use is the UGA Weather stations to see data like daily evapotranspiration. The evapotranspiration rates during the end of June were high. Just pick a site and enter a timeline on the water balance tab. It should be noted that the weather station reported Evapotranspiration is not direct crop water usage. To obtain current crop water usage ET must be multiplied by the current crop coefficient. This is how the UGA Extension Checkbook method was developed and how the SmartIrrigation CropFit App works in real time. The Checkbook was created based off historical ET rates and crop coefficients, therefore there is a good chance the water being recommended by the Checkbook may be insufficient for the current conditions. Please keep this in mind when irrigating crops, especially during hot, high west winds and low humidity environments (similar to our recent weather). While the Checkbook is a good tool, soil moisture sensors or apps are far superior in irrigation scheduling.

Cotton that was planted during May in Georgia should be squaring by now and approaching bloom, if it hasn't already begun blooming. Bloom occurs roughly 9 weeks after planting and water requirements ramp up significantly and approach peak demand during this time. During late June, as we are writing this, there are many irrigated fields with low levels of plant available water. If this was the case in your fields, please consider that it may take more than one application of irrigation, or rainfall (hopefully), to increase moisture back to a sufficient level. If levels are not maintained at sufficient level and we are nearing wilting point on a regular basis were most likely impacting yield. Irrigation requirements and demand are very critical during the "First flower to first open boll" period of development. This growth stage takes place during weeks 9-17 after planting. I have heard a lot of growers make the statement that we're still early in the season, however, cotton planted in May is moving into mid-season and peak water usage currently. Thus, based on when your cotton was planted, you will probably enter peak demand during the month of July. During this stage, cotton may require up to 1.5 inches **per week** or 0.2 inches **per day**. Keep in mind that the Soil Water Holding Capacity (SWHC) of most of our soils is around 1.0 inches/foot of soil. The crop can only access water where it has roots and of this SWHC only about 50% of it is plant available. Thus, a cotton plant with an 18-inch rooting depth will have access to 0.75 inches of water at field capacity. With an average ET rate of 0.25 inches and the crop coefficient being over 1 the cotton will require irrigation every 3 to 4 days minimum based on rainfall and irrigation efficiency during this stage. It is important not to let your cotton crop experience water stress during the flowering stage, as

stress during this stage can reduce plant growth which in return can reduce the number of fruiting sites that are initiated.

The main thing to keep in mind is that these water requirements are based on a historical average and that the crop may not necessarily need or use the amount of water as shown in the graph below. If you have cooler and cloudier or more humid days, your crop may not use nearly as much as it would if it would on a hot, sunny, and dry day. The graph below should give you a good idea of your weekly water requirements through the month of July **IF** you planted between mid-April and mid-May. If you planted later keep in mind that the Checkbook was developed from an estimated May 1 planting date, thus, you will need to adjust for higher temperatures and ET rates and will require on average more irrigation than represented in the Checkbook, especially if it remains hot and dry.



If you are using sensors for irrigation, you will typically notice that during July water usage occurring from the deeper sensor depths. This usually happens rapidly and unexpectantly. The ramp up in water use will occur sometime during peak bloom, usually around weeks 3-6 of bloom. It is important to monitor the crop and soil moisture moving into this stage and make sure that you do not fall behind on irrigation putting the crop into potential stress during bloom. It is very hard to replenish deep soil moisture with irrigation alone. Thus, falling behind moving into peak water usage will make it very difficult to "catch-up" as we were discussing earlier. Additionally, over-irrigating cotton will cause yield reductions. Thus, it

is important to follow a good irrigation scheduling strategy that recommends irrigation when it is needed. For more information on irrigation scheduling for cotton contact your local UGA County Extension Agent, general water use curves can be found at: Irrigation Reference Guide for Corn, Cotton, Peanuts, and Soybeans | UGA Cooperative Extension.

Common Nutrient Deficiency Symptoms in Cotton (*Henry Sintim and Glen Harris*): Several cotton fields in Georgia are at the reproductive stage, which is a period of high nutrient demand. A major concern this year was the extensive wet conditions during the early growth season stages. The condition has the potential to impair root development, inhibiting the plants nutrient uptake to meet nutrient demand. Moreover, the wet conditions at the early growth stages was followed by prolonged dry periods, which could potentially impair nutrient uptake, especially under rainfed conditions. Inadequate nutrient supply would cause the plants to exhibit visual symptoms. The deficiency symptoms could be used as an initial diagnosis of plant nutrients when scouting fields.

Common symptoms of nutrient deficiencies include stunted growth, chlorosis, interveinal chlorosis, purplish-red coloring, and necrosis. Stunted growth refers to plants being small in stature compared to healthy plants, and it results from reduced cell elongation of plants. Chlorosis refers to either entire plants or plant leaves turning light green to yellow or appearing more localized as white or yellow spotting. Interveinal chlorosis, however, is the yellowing of leaf tissue between veins, with the veins themselves remaining green. Purplish-red coloring results from elevated levels of anthocyanin, which is a purple-colored pigment, and necrosis refers to the death of plant tissues often appearing brown.

Deficiency symptoms relate to some functions of the nutrients in the plants. Moreover, the mobility of nutrients in plants affects how plants respond to nutrient deficiencies. Therefore, important steps in diagnosing nutrient deficiency symptoms in plants entail describing the nature of the symptoms and determining whether it is a deficiency in mobile or immobile nutrients based on where the symptoms first appear in the plant. Mobile nutrients can move out of older tissues to younger plant parts when deficient in plants. Thus, visual deficiency symptoms appear first in the older or lower tissues. If the deficiency becomes severe, the symptoms spread throughout the plant. In contrast, immobile nutrients do not readily move within the plant. Thus, their deficiency symptoms first appear in new growth or young tissues and can be localized. Mobile nutrients include nitrogen, phosphorus, potassium, and magnesium, whereas manganese, sulfur, copper, iron, calcium, and boron are common immobile nutrients in plants. Here we provide common visual nutrient deficiency symptoms in cotton to help with initial assessments of a nutrient deficiency problem.

Nitrogen deficiency

If nitrogen deficiency occurs during the early season, you will observe stunted cotton plants showing yellowish-green leaf colors that are small in size. Because nitrogen is mobile and can be moved to developing tissues, the nitrogen deficiency will first appear on older leaves as yellowing. Know that if

nitrogen deficiency starts occurring during the later stage of the growing season, the lower leaves that were already formed will only show yellowing and will not necessarily be small in size. The new leaves that are being formed will be smaller even though the yellowing will not be very obvious in the initial stages. As the nitrogen deficiency gets severe, eventually all the newer tissues will also start yellowing, and in very severe cases, there will be reddening of the leaf blade. In general, cotton plants deficient in nitrogen mature prematurely, have poor boll retention, and ultimately yield lower.

Photo showing a healthy cotton leaf (left) and a cotton leaf deficient in nitrogen (right). Source: North Carolina State University Extension.

Photo showing a healthy cotton plant (left) and a cotton plant deficient in nitrogen (right). Source: Yara North America.

Phosphorus deficiency

Phosphorus is mobile in plants so deficiency appears first on older leaves. The leaves become dark green with purplish reddening. The tips of leaves and leaf margins become necrotic (dead tissue) as symptoms persist. The plants can also show reduced root systems, stunted growth, delayed flowering, and poor boll retention. While the obvious symptom of phosphorus deficiency is the purplish reddening of the leaves, it is important to note that sometimes stunted growth may be the only evidence of phosphorus deficiency. This can easily be overlooked or wrongly attributed to other factors. Periodic soil and tissue analyses may be necessary because phosphorus deficiency can sometimes be quite difficult to spot in the field.

Photo showing the lower leaf of a cotton plant turning dark green and purplish red color due to phosphorus deficiency. Source: California Department of Food and Agriculture

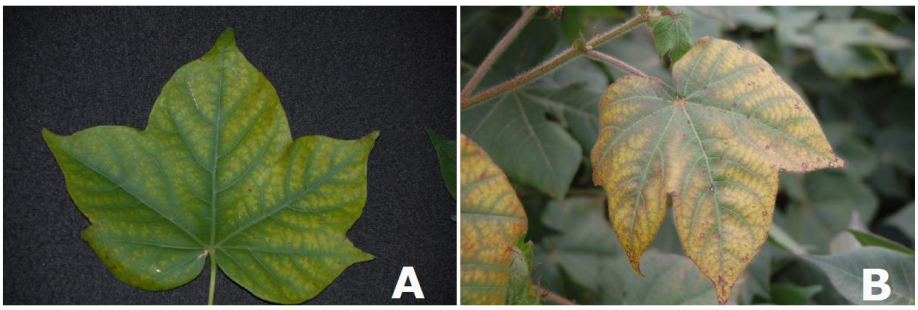
Photo showing advanced phosphorus deficiency in a cotton plant with dark green and purplish red color. Source: Yara North America.

Photo showing a healthy cotton plant (left) and a plant deficient in phosphorus (right). The phosphorus-deficient plant does not show obvious purplish-red color. Also, the leaves are not dark green but yellowish. Source: Yara North America.

Potassium deficiency

In the early season, potassium deficiency shows first in the lower canopy and then later spreads throughout the plant. The plants show a light green to gold mottling between leaf veins, which progresses to yellowing and then browning and necrosis (dead tissue) of the leaf margins. Mottling is a pattern of irregular marks or spots of different shades or colors. In the late season, deficiency symptoms appear first on the younger leaves, typically, in the upper third of the canopy. Ultimately, this can lead to premature leaf shedding, early cut-out, poorly formed bolls, inferior lint quality, and reduced yield. The entire leaves

of young cotton plants can show symptoms under very severe potassium deficiency conditions. Also, the level of expression of potassium deficiency symptoms could vary depending on the variety and environmental conditions.



Photos showing initial symptoms (A) and severe symptoms (B) of potassium deficiency in cotton. Source: Mississippi State University Extension.

Photo of cotton at pre-bloom stage showing potassium deficiency symptoms.

Sulfur deficiency

Sulfur is not very mobile in the plant so deficiency symptoms appear first on younger or upper leaves and leaf veins. The leaves become pale green or yellowish. This is different from nitrogen deficiency where the symptoms are observed on lower or mature leaves. Sulfur deficiency causes newly formed leaves to be smaller, and it also reduces vegetative branches and boll size.

Photo showing symptoms of sulfur deficiency in a cotton plant. Source: Yara North America.

Photo of cotton plants showing symptoms of sulfur deficiency. Source: The University of Florida Institute of Food and Agricultural Sciences.

Boron deficiency

Boron deficiency in cotton causes a distorted and stunted terminal (dwarfed plants), as well as abnormal growth of the uppermost leaves. Boron deficiency may also cause the formation of dark concentric rings on the leaf petiole. The leaf petioles are also shortened and thicker than those in healthy plants. Flower abortion and boll shedding may occur in some conditions, contributing to excessive stalk growth. Note that the damage from lygus (*Lygus hesperus*) may appear similar to boron deficiency symptoms.

Photo of a boron-deficient cotton plant showing distorted growth of the uppermost leaf. Source: North Carolina State University Extension.

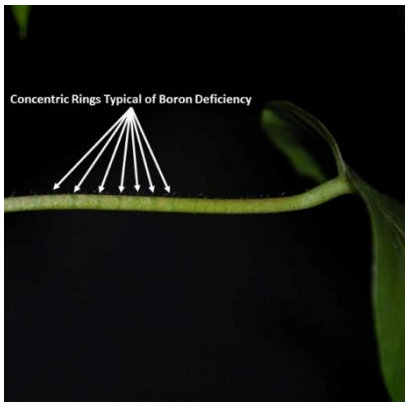


Photo of a boron-deficient cotton leaf petiole showing dark concentric rings. Source: Mississippi State University Extension.

Wind and Hail Damaged Cotton (*Wade Parker*): As I write my submission, it rained last night at my house for the first time in several weeks. I almost did not recognize the sound of the rain hitting the house! A few weeks prior there was a severe thunderstorm in our area that was very localized. While small in scope, the damage inflicted was pretty serious. This storm had strong straight-line winds that did a lot of structural damages to homes. An unexpected result of this was the knocking over of cotton in the 5^{th} or 6^{th} leaf stage along with slight to moderate hail issues. I have seen cotton knocked over in the past, but it always seems to stand back up. This time was different, while most of it stood back up, some of the plants starting growing erratic, with even the root system being affected. If I had not been aware of the storm, I would have thought this damage was herbicidal, as the symptoms very much resembled a growth regulator type herbicide. The plants pictured below will obviously not yield as much as one that has not been damaged, but the good news is that in most cases, even in a bad storm plants such as these are in the minority and not majority. The days before conservation tillage and cover crops used to yield a lot of erosion damage from blowing soil and would literally blast cotton plants. Sand abrasion damages the cells and ruptures the contents, often creating a water-soaked appearance of leaves. The survival of plants due to soil abrasion is contingent on the damage inflicted to the growing point in the terminal. The terminal of the plant is the life blood and is often the first thing I check when evaluating damage.

These same concepts apply to hail damage as well. There is nothing more uglier than going to a field, regardless of the crop that has been ripped apart with hail. At first glance, one would think it will never make it, as the ground is littered with leaves and in severe cases entire stems and petioles are damaged. However, cotton has the ability to make a remarkable comeback. As is the same with deer damage, if the cotyledons are destroyed, then the plant is toast. Plants with terminals missing or damaged usually recover but evolve into “crazy cotton,” which is hyper growth from fruiting and vegetative branches, as hormones are produced that encourage this growth habit. In addition to the terminal, pay close attention to the stem health. Hail tends to bruise stems, which could cause lodging and future lodging. At the end of the day, it is our job to assist growers as they will have to make important management decisions, especially early in the season. A stand count assessment is advised to help the grower decide as to whether to continue the crop or replant if the planting window is still open. Overall health of the plant approximately two weeks from the storm event is very important. Many people are remarkably surprised when they return to the

field and see the positive transformation. Keep in mind that cotton is most vulnerable at the early seedling stage and as heavy fruiting progresses. The early seedling is not big enough to withstand much damage and the later stage makes for a slow recovery, as the plant is so engaged in boll setting and fill. Therefore, the stage of growth in between the two described is the best case if a field were to be hit.

Cotton showing stem deformation due to strong straight-line wind. Notice poor root growth.

Poor root growth could result in little or no anchor and cause plant to be susceptible to lodging and not being able to support basic functions

The Importance of Flowering in Cotton (*Josh Lee, John Snider, and Camp Hand*): As the 2024 cotton season rolls on, most of the crop is at squaring, and the earlier planted fields are entering the flowering stage. As growers, consultants, scouts, agents, and others drive by cotton fields, it may not be possible to readily see blooms from the road. This is because cotton first blooms at the lower sympodial (fruiting) branches (Figure 1 and 2). Therefore, as our fields begin to approach first flower, it will be important to look in the lower crop canopy. For this month's newsletter we are going to discuss monitoring plant horsepower, the key phases of flowering, and flower color significance.

Nodes Above White Flower (NAWF):
As Dr. Hand and many others have mentioned before, NAWF is a measure of plant horsepower. What does this mean? First, NAWF refers to the number of mainstem nodes above the uppermost first position white

flower. At first flower, NAWF values of 8-10 indicate a crop that has high growth potential (lots of horsepower), while NAWF values of 3-5 at first flower indicate low growth potential (little horsepower). Low NAWF values can be attributed to crop stress; for example, low nitrogen levels and limited water access would lead to shorter plants with less growth potential compared to plants that are well-watered with sufficient nitrogen. NAWF will steadily decline as flowering progresses under high retention, while steady NAWF during flowering indicates poor retention. This is because good fruit retention helps restrain new vegetative growth.

Figure 1. First position white flower. Photo by Josh Lee.

First Flower

First flower is documented when 50% of the plants in a field have produced their first white flower, which occurs roughly 60 days after planting. High temperatures and cloudless conditions can reduce the number of days until first flower. Water use during flowering also begins to increase as cotton now has vegetative and reproductive growth occurring simultaneously (see Dr. Porter's section of this newsletter concerning water requirements). First flower is also a time that many growers apply plant growth regulators (PGRs). Timeliness is key to maintaining the proper balance between vegetative and reproductive growth in cotton!

Because flowering also marks the beginning of boll development, the flowering period is an important growth stage to scout for boll-injuring pests such as stink bugs.

Figure 2. Cotton plant at first flower. Photo by Josh Lee.

Peak Bloom:

Peak bloom is when the rate of white flower production per day is at the maximum and typically occurs 2-4 weeks after first bloom. Environmental conditions and management practices such as irrigation, fertility, and PGRs will govern the timing of peak bloom. A plant with more horsepower at first flower will reach peak bloom later than a plant with low horsepower at first flower. Be sure to consult other resources and the newsletters regarding information on best management practices during peak bloom. Fruit shed will also be seen during this period as cotton sheds almost 60% of its fruit in non-stressed environments. These values can be higher under stressed conditions.

Flower Color:
When scouting flowering cotton, there will be a mix of flower colors (Figure 3). The day a flower opens, it will be a white/cream color and will be pollinated that same day. On the second day, petals will turn pinkish and then red on day three. Approximately a week later, that same flower will fall off (or sometimes stay on which is referred to as a bloom tag) and at the base of the flower will be the developing boll. Young bolls within the first week of flowering will be the most likely to shed.

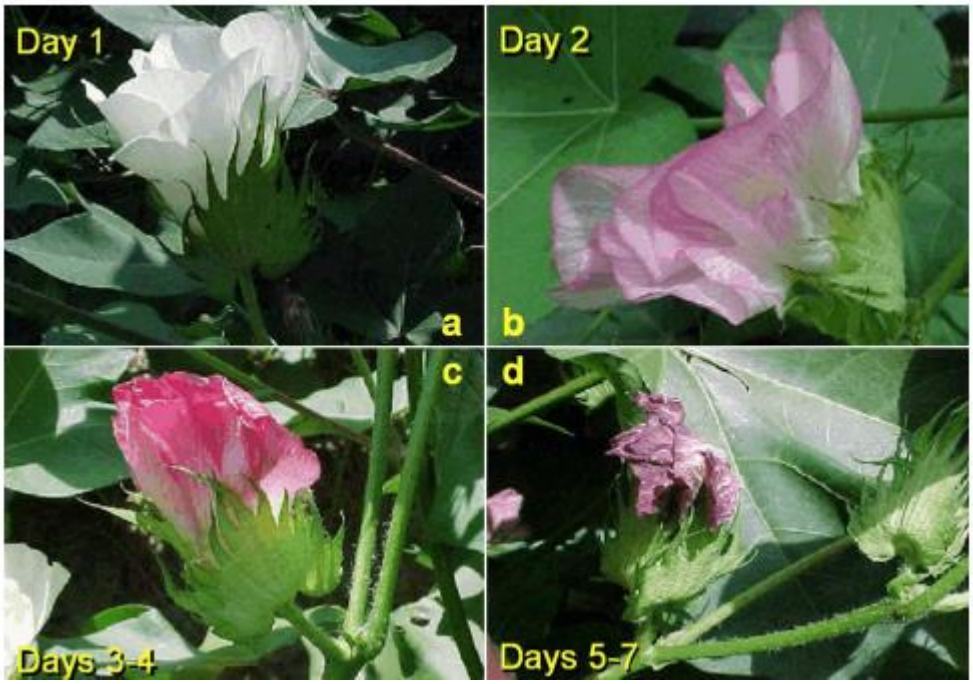


Figure 3. Cotton Flower Progression. (Ritchie et al., 2007)

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Ritchie, G.L., Bednarz, C.W., Jost, P.H., Brown, S.M., 2007. Cotton growth and development. The University of Georgia, College of Agricultural and Environmental Sciences, Athens, GA. Bulletin 1252.

Thoughts on PGR use (*Camp Hand*): It is that time of year – it's hot outside, the gnats are flying, and the cotton is growing (where we have irrigation or have had rain recently). So the questions I am getting right now are revolving around plant growth regulators and their use in cotton. There are a few things I would keep in mind as we are making these decisions.

1. **Different varieties need different PGR programs**

Some varieties are inherently more aggressive than others, and many of you know that from firsthand experience. Since I started at UGA, I have been playing "catch up" on these newer varieties, but below is my "PGR Responsiveness" chart that I have worked on over the last three seasons and will continue to build on in the future. You will notice that this chart is not recommending PGR programs by variety, but is more to sort the varieties so they can be grouped with comparable varieties based on the data we have collected over the years in Tifton, Midville, and Attapulgus. The varieties are sorted into four categories going from Least Responsive (needs more frequent apps/higher rates of PGRs) to Most Responsive (fewer applications/lower rates). If you have questions please feel free to reach out to your local UGA County Agent.

PGR Responsiveness of Varieties

Responsiveness to PGRs	Variety
Least Responsive (i.e. Highest growth potential)	DG 3615 B3XF, DG 3799 B3XF, DG H959 B3XF, DG 4484 B3TXF DP 2055 B3XF, DP 2131 B3TXF
Varieties with similar growth potential as first group, but slightly more responsive to PGRs	DP 1646 B2XF, DP 2012 B3XF, DP 2038 B3XF, DP 2127 B3XF, DP 2141 B3XF, DP 2211 B3TXF PHY 545 W3FE ST 5091 B3XF NG 4190 B3XF AR 9371 B3XF, AR 9831 B3XF
Varieties that may need PGRs, but pre-bloom applications not typically necessary	ST 4595 B3XF, ST 4990 B3XF DG 3528 B3XF NG 3195 B3XF, NG 4936 B3XF, NG 3299 B3XF DP 2020 B3XF, DP 2239 B3XF, DP 2333 B3XF PHY 411 W3FE
Most Responsive (i.e. Lowest growth potential)	PHY 360 W3FE, PHY 400 W3FE DP 2115 B3XF

2. **Know your ground**

Some fields have higher growth potential than others, whether that is due to fertility, water availability, or some other factor. Know your ground, and know that some fields may require more PGRs than others.

3. **Know the product you are using!!!**

I know this seems silly to mention… but I feel like I need to. The Mep 6X type products are becoming more and more common around our state. I held out on using it until this year, but I finally had to start using it. I sprayed some of our oldest cotton with this product last week, and I double checked my math multiple times prior to mixing to make sure I didn't make a mistake! When so many of us are used to slinging pints of 4.2% product, it would be very easy to just mix it up and roll. I know a friend that sprayed a pint of the 6X product last year on some dryland on accident… Let's just say that field didn't make as much as it should have. Be careful at the mixing pad and make sure you know the product you are using!

There are many other factors to take into consideration, but many of the basics can be found in a publication on Cotton Growth Monitoring and PGR Management. This publication discusses making PGR decisions based on crop growth and other things going on in the field such as pest management.

As always, if you need assistance with a PGR decision, feel free to reach out to your local UGA County Extension Agent.

Goosegrass, Nutsedge, Spiderwort, and Liberty (*Stanley Culpepper*): What a challenging year it has been to not only plant the crop, but to also attempt to control weeds. Across the state, there is cotton ranging in size from recently emerging all the way through blooming, with many of these fields infested with more weeds than in previous years. The weather has certainly been a significant challenge but so has the limited availability of in-crop dicamba. The two factors coupled together have led to an excessive number of weed control calls to Extension. Let's review the most common topics.

Goosegrass. Over the last three years, we have highlighted the explosion of goosegrass and the difficulty of controlling it once it is emerged. This pest is quickly climbing to be our number 2 most problematic weedy pest; a few management thoughts are provided below.

MANAGING GOOSEGRASS
1. Although it's too late now, one must understand an effective residual herbicide applied at planting is required for successful management; Warrant and the yellow herbicides can be effective options for cotton. **2. Overlapping residual herbicides from planting through layby is critical to prevent its emergence throughout the season; residuals often applied over the cotton crop that can provide effective residual control include Warrant, Dual Mag., and Outlook.** **3. Mixing dicamba or glufosinate (Liberty, others) with Roundup will almost guarantee antagonism resulting in far far less goosegrass control compared to Roundup alone, and by the way these mixtures are rapidly selecting for resistance to Roundup!** **4. For emerged plants hopefully 2 inches or less, Roundup alone at the full rate or mixed with Select (many brands) is advised. Sequential applications may be needed, and control may still not be complete (there is a reason this is such a problematic weed).**

Nutsedge. Like goosegrass, nutsedge populations are exploding across our state. This pest was once controlled by most cotton programs; however, it currently seems as if the weed is walking right through our efforts. Nutsedge has few economically effective management options.

MANAGING NUTSEDGE
1. It's probably too late for this year but for next year, when nutsedge patches are up before planting, apply 60 oz/A of Roundup PMAX 3 or equivalent and follow with paraquat or tillage 5-7 days later and then plant immediately. Nutsedge does not tolerate shade well, get a head start!
2. Reflex at planting suppresses yellow nutsedge.
3. Sequential applications of Roundup in-season are critical to overall success; Envoke is labeled overtop of cotton and is effective but one needs to be prepared for cotton yellowing and stunting. However, damage from a relevant nutsedge population is greater than that from Envoke.
4. A directed layby application is <u>absolutely</u> required; diuron + MSMA + Envoke or Roundup + diuron + Envoke are extremely effective.

Spiderwort. For those fortunate enough to get rain over the last week, a tremendous flush of spiderwort has occurred in some fields. Nothing new with spiderwort, just a few reminders.

MANAGING SPIDERWORT
1. Residual herbicides including Warrant, Dual Magnum, and Outlook are the key to success; overlap these products throughout the season to combat continual emergence of the weed.
2. Gramoxone, 2,4-D, and Direx + MSMA can be extremely effective for emerged plants.
3. A layby directed application is required for season-long management; Direx + MSMA + Warrant, Dual, or Outlook is superb and one of the more effective options.
4. Roundup plus Staple is better than Roundup plus dicamba but both usually only hold the spiderwort in place, buying time for the layby directed application.
5. Liberty is just not an effective option; Roundup is much better.

Glufosinate (Liberty, others). A large increase in the use of glufosinate has obviously occurred. As one of my close colleagues from Tennessee always says, glufosinate is the most finicky herbicide we use and he is exactly right. However, there are many application decisions one can follow to maximize activity of the herbicide.

MAXIMIZING PIGWEED CONTROL WITH GLUFOSINATE (LIBERTY, OTHERS)
1. Apply 32 oz for 3" pigweed, 36 oz/A for 4" pigweed, and 43 oz/A for anything larger; see label for maximum use rate if planning to make a sequential application.
2. A state label allows sequential applications within 5 days if needed (this is for larger pigweed).
3. Avoid applications within 1.5 hrs of sunrise and 2 hrs of sunset.
4. Apply in no less than 15 GPA, with 20 GPA being more effective; also slow the sprayer speed down to facilitate maximum spray coverage!

<u>Important Dates:</u>

Georgia Cotton Commission Mid-Year Meeting - Statesboro, GA – July 24, 2024
Attapulgus Research and Education Center Field Day – Attapulgus, GA – August 1, 2024
Southeast Research and Education Center Field Day – Midville, GA – August 7, 2024

Southwest Research and Education Center Field Day – Plains, GA – August 15, 2024
Cotton and Peanut Research Field Day – Tifton, GA – September 4, 2024
Georgia Cotton Commission Annual Meeting and UGA Cotton Production Workshop - Tifton, GA – January 29, 2025