UNIVERSITY OF GEORGIA EXTENSION

UGA Cotton Team Newsletter
September 2024

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4. Timeliness of defoliation and protecting fiber quality (*Josh Lee, John Snider, Jayson Wisekal, and Camp Hand*)
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Late-season nutrient monitoring and management in cotton (*Henry Sintim*): In the August Newsletter, we presented common visual nutrient deficiency symptoms in cotton. Deficiency symptoms become more prevalent during the reproductive and boll development stages. As the cotton plant diverts its resources towards boll formation, it becomes more susceptible to nutrient stress. It is important to diagnose and determine the cause of the deficiency so that appropriate measures can be taken. Sometimes, the appropriate measure is to do nothing in the current growing season, especially at very late stages.

Nitrogen and potassium tend to be the most affected nutrients in the late season in Coastal Plains soils typical in Georgia. As nitrogen is crucial for overall plant growth and plays a pivotal role in cotton fiber development, late-season nitrogen deficiency can result in smaller balls, reduced fiber quality, and early cut-out. Potassium is particularly essential for boll development and fiber quality, so deficiency can lead to smaller bolls, reduced fiber strength, and increased susceptibility to diseases and pests. For instance, Cercospora, Alternaria, and Stemphylium leafspots have all been linked to potassium deficiency, and if potassium deficiency is avoided these leafspots should not be an issue. While late-season deficiencies of nitrogen and potassium are the most common, they can occur in all the other essential plant nutrient elements.

Figure: Foliar symptoms of late-season potassium deficiency in cotton. Source: Mississippi State University Extension (https://www.mississippi-crops.com/2015/07/19/potassium-deficiency-in-cotton/).

Figure: Foliar symptoms of Alternaria (A), Cercospora (B), and Stemphylium (C) leafspots in cotton. These diseases have been linked to potassium and are usually not a problem if potassium deficiency is avoided. Source: Cotton Incorporated (https://www.cottoninc.com/cotton-production/ag-research/plant-pathology/diagnosis-management-foliar-diseases-2/).

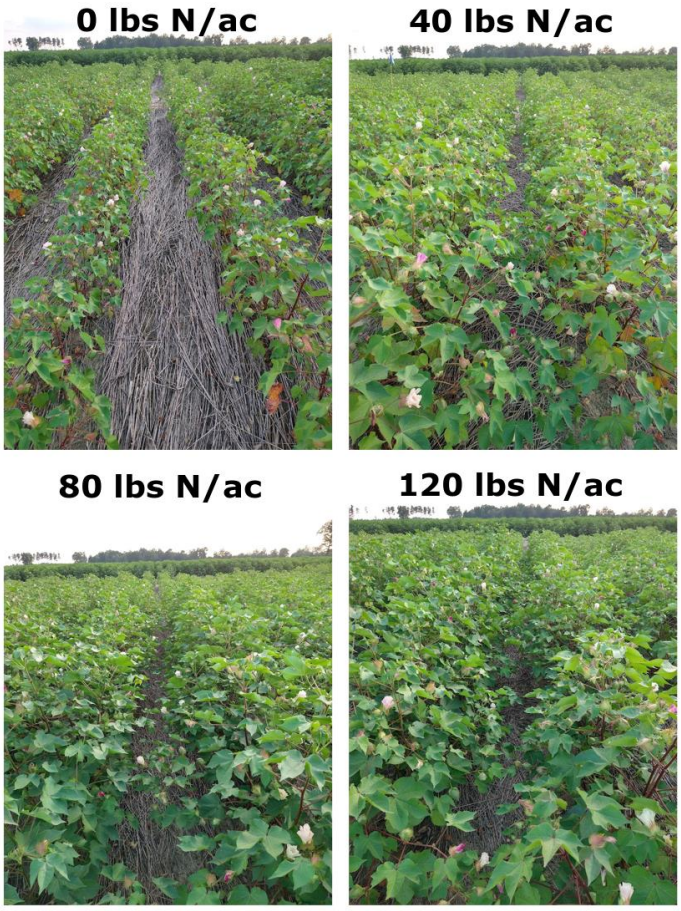

Figure: Side-by-side comparison of cotton at the boll stage from plots of nitrogen rates studies in Midville, GA. The plots that received 0 and 40 lbs/ac show symptoms of late-season nitrogen deficiency.

Common Causes of Late-Season Nutrient Deficiency:

Several factors contribute to late-season nutrient deficiency in cotton. Some common factors include:

1. **Inadequate Nutrient Supply**: Late-season nutrient deficiency is certain to occur if the recommended fertilizer rates are not applied.
2. **Increased Nutrient Uptake:** Cotton plants absorb nutrients at varying rates throughout the growing season, with higher demands during reproductive stages. The problem is more severe when there is a high boll load.
3. **Leaching and Runoff:** Heavy rainfall or excessive irrigation can lead to nutrient leaching and runoff, depleting soil nutrient levels.
4. **Root Limitation:** A poorly established root system will constrain the plant's ability to access nutrients in deeper soil layers.
5. **Inadequate Soil Moisture:** Soil moisture is needed to solubilize nutrients and make them available for plant uptake.

How to Address Late-Season Nutrient Deficiency:

1. **Diagnosis:** The first step to efficiently address late-season nutrient deficiency is to properly diagnose the problem. Observation of nutrient deficiency symptoms is an initial step, and quite useful when management practices are taken into consideration. However, soil and plant tissue sampling from healthy areas and the affected areas is needed to confirm the nutrient deficiency.
2. **Fertilizer Source:** Once the deficient nutrient has been identified, it is important to supply that nutrient to the crop. Foliar or injection through irrigation systems are the most convenient, but granular sources could also be considered when high-clearance spreaders are available. They can be equally effective, especially when it rains, or the fields are irrigated shortly after application. Care must be taken when using foliar application to avoid causing significant leaf burns.
3. **Timing:** Apply nutrients at the right time to meet the cotton plant's peak demand during the reproductive stage. No application should be considered when there is a boll opening. The effectiveness of late-season nutrient application diminishes as you pass the 5th week of bloom, and hardly will you get a yield response past the 8th week of bloom.
4. **Irrigation Management:** Ensure efficient irrigation practices to reduce nutrient leaching and runoff.
5. **Monitoring:** Regularly scout the field for early signs of nutrient deficiency symptoms before they become too severe. Periodic soil and tissue analyses are very helpful in this regard. The recommended nutrient sufficiency ranges for plant tissue analyses for cotton can be assessed via the following link. https://aesl.ces.uga.edu/publications/plant/Cotton.html

Conclusion:

Late-season nutrient deficiency in cotton is a challenge that can impact cotton productivity and quality. However, with proactive soil and plant tissue testing, optimum nutrient application, and timely

interventions, farmers can minimize the risk and ensure a successful cotton harvest. Stay informed, monitor your fields, and make the necessary adjustments to manage late-season nutrient deficiency effectively.

Importance of end-of-season irrigation termination and disease control in cotton (*Wes Porter, David Hall, Jason Mallard, Phillip Edwards, and Daniel Lyon*): As we approach the end of the growing season we should be around 16 to 20 weeks after planting moving through September and into October based on a May 1 planting date. It is important to note the wide range of planting dates that we have had during the 2024 season. While most of our early and May planted cotton has or will reach irrigation termination before the end of September. However, if you have later planted cotton it is important to utilize UGA"s Irrigation Reference Guide to determine when you can consider terminating irrigation. During an average year we will be around 14 to 18 weeks after planting throughout the month of September. This will place our water usage past peak and moving through declining and to termination. UGA Extension cotton irrigation scheduling guidelines, like all other guides, must be used in conjunction with current field and atmospheric conditions. That means boots on the ground, scheduling apps, or moisture sensors to assist you in determining available moisture in the soil. September is historically dry with low humidity leading to soils drying out faster. It is hard to tell what the long term forecast holds, but we will need to make smart irrigation decisions as we finish this season. Hopefully, we get a few rain events to carry us through the end. Growers should keep in mind that the cotton plant moisture requirement is low, but there still is a need for some moisture in the soil to aid in finishing out those last harvestable bolls. Do not let the profile dry out and stay on top of irrigation if you have not had an ample rainfall event over the past three or more weeks. This will be a case by case basis, but at this time if you have properly managed your irrigation and have sufficient soil moisture my recommendation is to terminate irrigation if you have open bolls in your field.

Growth Stage	DAP	Weeks after Planting	Inches/Week	Inches/Day
Emergence	1 - 7	1	0.04	0.01
Emergence to First Square	8 - 14	2	0.18	0.03
	15 - 21	3	0.29	0.04
	22 - 28	4	0.41	0.06
	29 - 35	5	0.56	0.08
First Square to First Flower	36 - 42	6	0.71	0.10
	43 - 49	7	0.85	0.12
	50 - 56	8	1.08	0.15
First Flower to First Open Boll	57 - 63	9	1.28	0.18
	64 - 70	10	1.47	0.21
	71 - 77	11	1.52	0.22
	78 - 84	12	1.48	0.21
	85 - 91	13	1.42	0.20
	92 - 98	14	1.30	0.19
	106 - 112	16	0.88	0.13
	113 - 119	17	0.69	0.10
First open boll to >60% Open Bolls	120 - 126	18	0.51	0.07
	127 - 133	19	0.35	0.05
	141 - 147	21	0.12	0.02
	148 - 154	22	0.05	0.01
	155 - 161	23	0.02	0.00
Harvest	162 - 168	24	0.00	0.00
	169 - 175	25	0.00	0.00

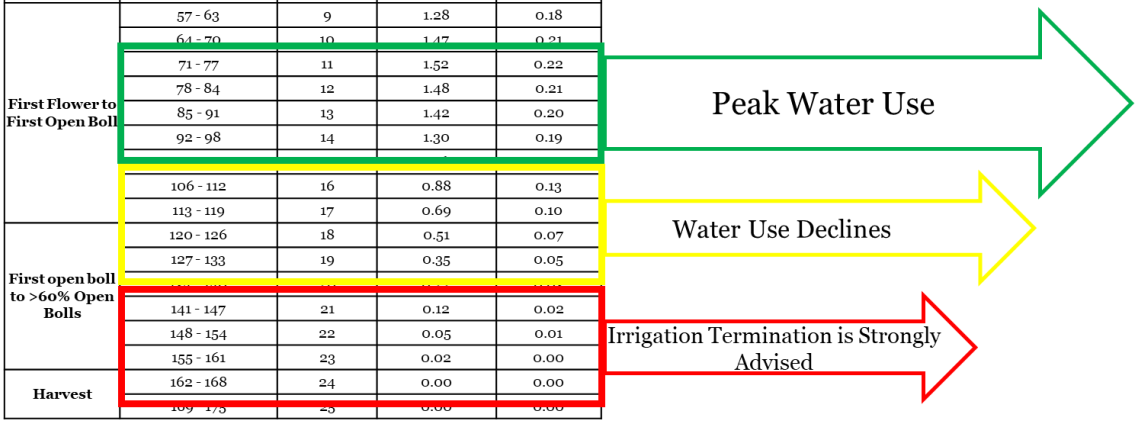

Figure 1. Seasonal cotton water usage with peak, decline and irrigation termination highlighted.

As water use declines, it is necessary to closely monitor your fields for cotton bolls that are beginning to open. UGA's official irrigation termination recommendation for cotton is at an average of 10% open boll across a field. When you consider the math, 10% open is not a high number of bolls on a plant that are open to start considering irrigation termination. A plant with 12 to 15 harvestable bolls means you need to be looking at the available soil moisture if 1.2 to 1.5 bolls are open. September 2019 was an anomaly that was hot and dry most of us remember it. Bolls were beginning to open but our available water in the soil was depleted very rapidly due to the environmental conditions. Due to dry soils, hot temps and long-term dry weather forecasts, one last irrigation event(s) was (were) needed to help finish the crop. The low humidity and sunny conditions helped to prevent open bolls from being damaged. Do not self-inflict or worsen boll rot issues if sufficient soil moisture is present. In times when an application of irrigation is needed, soak the soil sufficiently so that you can limit your irrigation events to as few as possible. Frequent small irrigation events will only exacerbate or flare boll rot, areolate mildew and other diseases. Paying attention to the long term and short-term forecast is critical in your irrigation scheduling decisions as always. The tropics have a way of surprising us with pop up storms or even hurricanes this time of year. Keep in mind, good moisture in the soil and 10% open bolls means the end of another irrigation cotton season!

An updated value by boll positioning chart was produced by Whitaker (2019) showing the importance of those lower and first position bolls.

Fruiting Location	Value
1st Positions	72%
2nd Positions	18%
3rd Positions	5%
Vegetative	5%
Nodes ≤10	60%
Nodes 11-15	31%
Nodes ≥ 16	9%

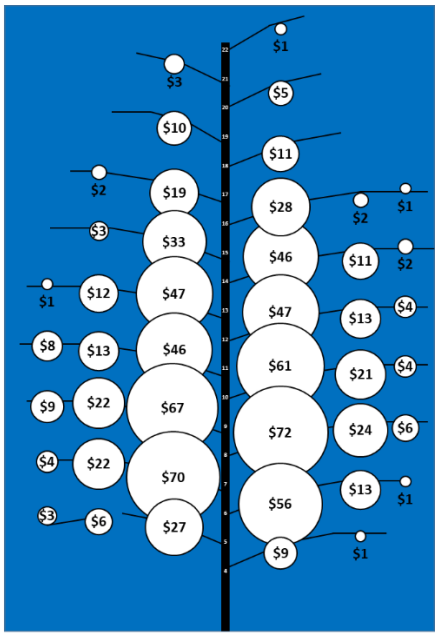

Figure 2. Boll position and value of boll position along the cotton plant, courtesy of Whitaker (2019).

This boll value tree really emphasizes the importance of first setting those high dollar bolls early in the season with proper management. Nearing the end of the growing season, overwatering and irrigating your crop with a higher than 10% open boll in an effort to make young upper position low value bolls open in the top will lead to losing or damaging your most valuable bolls and reducing yield and profitability. Not to mention, those young bolls probably will not mature enough to be harvested anyway. In a published study by Lawson et al. performed at Stripling Irrigation Research Park, there were no differences in yield of cotton that was terminated at cutout and at 10% open boll. This should aid providing some confidence in terminating at 10% open. If you have questions about finalizing irrigation, make sure you reach out to your local UGA County Extension Agent.

Terminating Insecticide Applications (*Phillip Roberts*): The decision to terminate insect controls can be challenging in some fields but a few basic considerations will assist in that decision. When evaluating a field a grower must first identify the last boll population which will significantly contribute to yield (bolls which you plan to harvest). In some situations the last population of bolls which you will harvest is easy to see (i.e. cotton which is loaded and cutout). In others, such as late planted cotton, the last population of bolls you will harvest will be determined by weather factors (the last bloom you expect to open and harvest based on heat unit accumulation). Once the last boll population is determined the boll development or approximate boll age should be estimated. Depending on the insect pest, bolls are relatively safe from attack at varying stages of boll development.

The table below list approximate boll age in days which bolls should be protected for selected insect pests. Cooler temperatures will slow plant development and subsequent boll age values may increase in

such environments. It is assumed that the field is relatively insect pest free when the decision to terminate insecticide applications for a pest is made.

Insect Pest(s)	Approx. Boll Age (days)
Corn Earworm Tobacco Budworm	18-20 bolls fully sized
Tarnished Plant Bug	15
Stink Bugs	25
Sucking Insects whiteflies aphids	harvest (honeydew accumulation on lint)

Timeliness of defoliation and protecting fiber quality (*Josh Lee, John Snider, Jayson Wisekal, and Camp Hand*): As we dust off the cotton pickers and get ready for another harvest season, this is the perfect time to discuss fiber quality. We have worked hard all season to make a good cotton crop! Let's be timely in defoliation and picking to reduce deductions at the gin. In this month's newsletter we will be discussing defoliation timing along with environmental factors that decrease fiber quality.

When do you pull the trigger on defoliating your crop?

The three methods for cotton defoliation

1. Precent open boll- apply defoliants when at least 60 to 75% of bolls are open.
2. Knife method- slice bolls open with a sharp knife to see if lint "strings" when the knife is pulled through the boll, seedcoat is tan, and seed leaves are fully formed.
3. Nodes Above Cracked Boll (NACB)- counting the number of nodes above the most recently open first position boll to the first position uppermost boll that is expected to contribute to yield (roughly a quarter diameter sized boll). NACB = 4 is safe to apply defoliants and corresponds to approximately 60 percent open bolls.

Image 1: Around 60% open bolls in the field (A), lint stringing using the knife method (B). Photos by Josh Lee and Jayson Wisekal.

Image 2: Four nodes above cracked boll. Photo by Josh Lee and Jayson Wisekal.

When applying defoliants, timeliness is essential to ensure that proper leaf drop is reached to keep the fiber clean at harvest. Scouting fields regularly will aid in correctly identifying the proper time for defoliant application. Timely harvest reduces the chance of yield loss and fiber quality degradation due to unfavorable weather conditions (i.e. excess rainfall and high winds).

Fiber Development and Fiber Quality

When a white flower opens, pollination occurs around 30 min later and fertilization of the ovules occurs 12 to 24 h later. The flower will then begin to turn pink in color the following day. The significance of this event is that the number of fertilized ovules in the cotton flower represent the highest number of seeds that could be produced in a particular boll. Without seed production, there would be no production of fibers. During the first three weeks after the flower has opened, both final seed volume and fiber length are determined.

Fiber development involves four phases

1. Fiber initiation- Occurs 0 days after flower opening where fiber cells begin to swell on the seed coat.
2. Fiber elongation- Occurs until about 20 days after flower opening, this is where length is determined.
3. Fiber thickening- Occurs at 15-45 days after flower opening; cellulose cells are deposited in circular rings and a secondary cell wall thickness is determined.
4. Fiber maturation- Occurs 45-50 days after flower opening; the boll opens and fibers desiccate and twist.

Fiber quality is a parameter that growers will have to keep in mind while harvesting. One of the main ways to prevent fiber degradation is to defoliate in a timely manner and immediately pick the field once the defoliants have done their job (picking can occur roughly around 2 weeks after defoliant application). The whitest and cleanest lint will come from bolls that have just opened following defoliation; however, weathering can quickly degrade fiber quality.

For this fiber quality parameter list, we will focus on factors affecting fiber length, strength, uniformity, and micronaire.

1. Fiber length- controlled heavily by variety and weather. Water stress and low potassium during fiber elongation can result in shortened fibers. High temperatures during fiber elongation can also shorten fibers by accelerating the elongation process.
2. Fiber strength- influenced heavily by variety and weather. If the cotton season is cut short and cool weather rolls in, strength can be reduced.
3. Fiber Uniformity- influenced some by variety but mostly by environmental conditions. Fiber uniformity continually decreases the longer open bolls are exposed to weather.
4. Micronaire- influenced by environmental conditions and variety. A season cut short by cool weather condition can decrease micronaire. High micronaire can be a result of drought stress and high temperatures that limit fruit retention and/or fiber length. High fruit retention rates can also decrease micronaire due to the plant not being able to allocate sufficient resources to many bolls. Recall that micronaire is a measure of fiber thickness, so if the crop has fewer bolls, more cellulose can be deposited per boll and per fiber.

Although variety can influence fiber quality parameters, that decision was already made by the grower before the season ever started. To preserve fiber quality and maximize yield now, it all comes back to one key management skill: timeliness. Timely defoliation sets the stage for a timely harvest, which maintains fiber quality potential. As we start harvesting this season, lets be timely and efficient to protect the crop that we have all worked so hard to produce.

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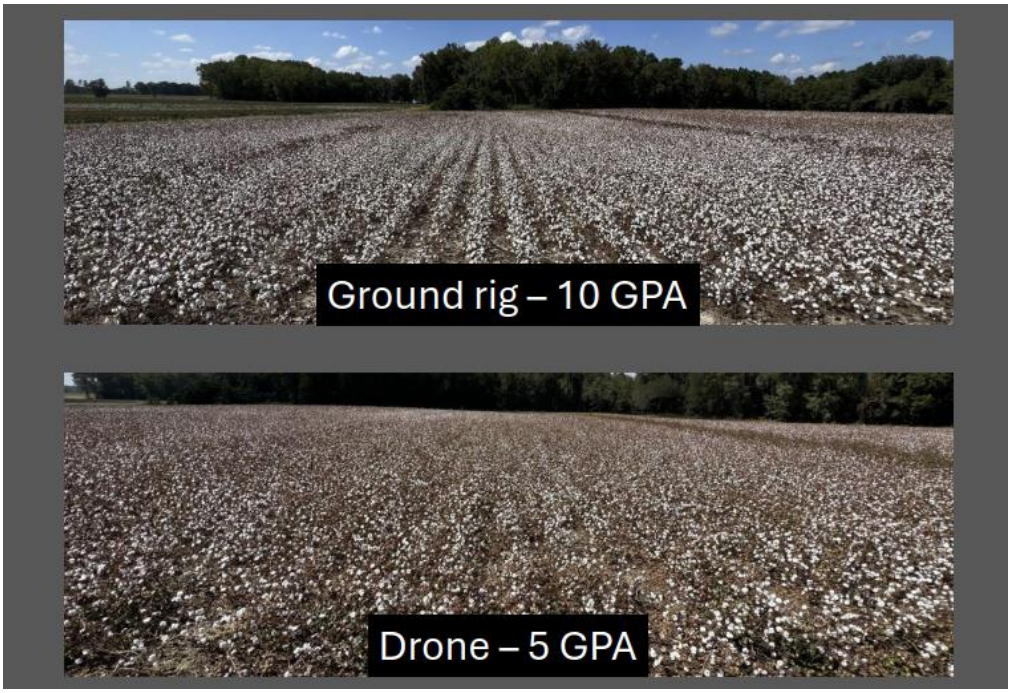
Get out there and get that cotton (*Camp Hand*): This is one of my favorite times of year. We get to see all of the time and work in this crop to fruition, but it's like I told my wife the other day. The two best times of year are planting and harvest – but once you get started there isn't any looking back. A few reminders as we head into defoliation and harvest:

1. **This crop is ahead of schedule!!!!** If you have heard me talk in person or on the podcast in the last 6 weeks, you have heard me say this. Based on growing degree days and personal observations in the field, our crop could be up to two weeks ahead of schedule. What does this mean? With peanuts being all over the board, **there is an opportunity to defoliate and pick some cotton before we get too far into peanuts!!!** Baker county agent Lanier Jordan told me that just a couple of days ago he checked some cotton that was 75 to 90% open, but the growers were hesitant to defoliate because their peanuts weren't ready. As any good county agent would do, Lanier advised them to knock the leaves off and get that cotton!!! Lots of other folks are in the same boat – if you planted cotton between April 15 and May 1, I would be looking at it hard. We defoliated some cotton on the station on August 30 that was planted April 17 – our next stop will likely be some cotton that was planted May 7 and 8.
2. **Get out and look at your crop!** Josh Lee wrote a great article for this newsletter on proper defoliation timing. Best way to know when to pull the trigger is to get out and look!
3. **Stay in touch with your county agent!** This time of year I send weekly emails to our county agents on considerations for defoliation (chemistries, rates, etc.) based on the weather outlook across the state. Information on products, rates, etc. can also be found on page 150 of the 2024 UGA Cotton Production Guide and in the Pest Management Handbook as well. At the end of this newsletter are the rate recommendations for the standard "three-way" defoliation mixture in Georgia based on temperatures around the time of defoliation as well.

One last consideration. Last year, many folks went out and bought spray drones. Some are using them to apply on their own farms and others are doing custom application work. **I would caution anyone thinking about using a spray drone to defoliate cotton.** Below are pictures from a ground rig applying the "three-way" at 10 GPA and a drone applying the same rates at 5 GPA. I cannot explain why, but the

drone application stuck leaves worse than the ground rig. We are doing this study again this season to try and get some answers, but just be cautious on using a drone. Make sure you follow all labeled regulations for aerial applications (most defoliants require 5 GPA for aerial applications) if using a drone as well.



Common tank-mixes for GA Growers

"Three-way" Defoliation Mixtures
(Ethephon + Thidiazuron + Tribufos)

Season (Temperatures)	Ethephon (Prep)	Thidiazuron (Dropp)	Tribufos (Folex)
Early Season (highs >90, lows >70)	21 to 24 oz (1.33 to 1.5 pt)	1.5 to 3.0 oz	6 to 10 oz
Mid-Season (highs 80<89, lows 60<70)	24 to 32 oz (1.5 to 2.0 pt)	2.0 to 4.0 oz	8 to 12 oz
Late-Season (highs <80, lows <60)	32 – 42 oz (2.0 to 2.67 pt)	---	16 to 20 oz

Ethephon = rates increase with cooler temps, less effective, need more boll opening
Thidiazuron = rates increase with cooler temps, less activity,
increase rate with more regrowth, more green
< activity when low is less than 65 F for 3 days
Tribufos = increase rate with cooler temps, too high can desiccate, need more later

Late season management considerations for diseases and nematodes (*Bob Kemerait*): Though the 2024 season is not over yet, opened cotton bolls will soon turn fields across Georgia snowy white. It won't be long until pickers are back in the field, lint is scattered along the roadsides, and modules and round-bales fill the gin yards. Diseases and nematodes have stolen yield from you, as they do every season. Though areolate mildew has been light to date, there has been no shortage of damage from nematodes, Fusarium wilt, and target spot.

There are eight primary disease/nematode conditions that could affect Georgia's cotton fields now, though each may not be present in every field. There is not much to be done about them now (unless you are more than a month away from defoliation in which case management of areolate mildew could still matter), but growers should watch carefully as harvest approaches so as to make the best management decisions in 2025.

1. Stemphylium leaf spot is present in most, if not all, fields and is identified by small-to-moderate sized lesions, often encircled by a dark, purple ring, on leaves showing signs of nutrient (potassium) deficiency. This disease seems to me most prolific in fields flooded with our tropical storm during August. Stemphylium leaf spot occurs in conjunction with a potassium deficiency in the plant and can lead to rapid defoliation and significant yield loss. Stemphylium leaf spot is a very important problem in the state and is likely overlooked as growers have either become too familiar with it or do not think that there is much that can be done. Stemphylium leaf spot typically occurs in the same areas of a field year after year- sandier areas, sometimes infested with nematodes. Growers should take special steps to manage soil fertility (and nematodes) to reduce losses to this disease. Fungicides are NOT effective in the management of Stemphylium leaf spot.
2. Target spot has been of moderate importance in Georgia's cotton this season, especially in the southwestern corner of the state. Cotton growers in areas most affected by target spot and areolate mildew are now more likely to use preventative fungicide applications than they have in the past. Use of fungicides is not always profitable if the level of target spot is low because of hot and dry conditions. However, I believe most growers who protect their cotton crop with fungicides when disease occurs early enough will see economic benefit in doing do.
3. Areolate mildew has been slow to develop in 2024 for reasons that I do not fully understand. I am hopeful that this disease does not become an every-year occurrence and problem for our cotton producers. However, all data from field trials demonstrates that where areolate mildew occurs early enough in the season, judicious use of fungicides increases yields by as much as 200 lb/lint per acre.
4. Bacterial blight has been a very minor issue in Georgia in 2024, demonstrating that the development and spread of a disease can be difficult to predict. However, there are at least a few fields where I expect yield losses to occur due to this disease. Growers are reminded to be careful in their selection of varieties in 2025 as resistant varieties are THE most important measure for managing this disease.

5. Fungal boll rots are always a threat in Georgia's cotton fields, especially in fields with excessive, rank growth where humidity and moisture are captured. Though not uncommon, boll rot diseases have been more moderate this season, likely as a result of extended periods of hot and dry weather. Growers are understandably frustrated at the losses, and even more frustrated at the fact there is little to be done to reduce the threat from boll rot. Fungicides are not an effective management tool for control of boll rot. We in UGA Extension continue to seek to develop improved recommendations for management of is complex of diseases.
6. Fusarium wilt is becoming an increasing problem in Georgia's cotton fields. I don't know if this is because the problem is spreading or simply because growers are paying greater attention to it. Outbreaks of Fusarium wilt were most pronounced in cotton fields in southeastern Georgia following the tropical storm in August. Fusarium wilt can ONLY be managed in our fields by managing the parasitic nematodes associated with it, often by treating the field with a nematicide.
7. Nematodes in general (root-knot, reniform, sting and lance) continue to be a significant problem in our cotton fields. Growers are encouraged to make time after harvest and before cold weather hits to take soil samples from areas of poor growth in order to determine if nematodes are indeed a problem. Growers can also look for the tell-tale "tiger striping" on leaves of affected plants that give good indication that nematodes are present. In addition to use of nematicides to protect cotton from nematodes in the 2025 crop, growers also can select cotton varieties that are resistant to the southern root-knot and the reniform nematodes.
8. Cotton leafroll dwarf virus continues to be present in fields across Georgia and was unexpectedly severe in some fields. Common characteristics of where CLRDV-induced bronze wilt was severe include specific varieties of cotton, late planting, and exposure to stress. We will have more information to present at our Extension Winter Production Meetings. In the past I have stated, "I cannot explain why CLRDV is not more of a problem in our cotton, but I am glad that it is not." In 2024, CLRDV-induced bronze wilt became a problem in a number of fields.

Taking stock of these eight disease and nematode issues now may not add value to the 2024 crop, but it will help growers to make more effective management decisions for 2025. I encourage growers to sample fields for nematodes after harvest and prior to our first cold snap. I encourage growers to recognize that the only effective management opportunities for nematodes, Fusarium wilt, bacterial blight, and CLRDV-induced bronze wilt must be made BEFORE the furrow is closed.

What can a grower do differently in 2025? (*Wade Parker*): The anticipation of defoliating a cotton crop can either bring excitement of a good year or rather disappointment. We have stories of both as we are still reeling from Tropical Storm Debby in addition to a dry spell that shows no end in sight. Many times we focus on the short-term situation as I have described and do not worry about long term issues. However, the end of the year should be a time to reflect on what a grower can do different. This is a common question as we enter the harvest season. Here are a few items that I handled this year that may need more thought as we enter 2025.

Variety Selection – Variety selection is not a one size fits all anymore. Since the discontinuation of DP 555, variety selection has become more precarious and detail oriented. In other words, everyone planted DP 555 and it fit pretty much anywhere in Georgia. That has changed. Growers need to focus and study the characteristics of the varieties and decide which one fits best on their field(s) and overall operation. An eye opener for me this year is noticing the many variances when completing the CLRDV evaluations on three trials. There were great differences in: first fruiting position, nodes above white flower, height, lodging (variety response to storm), internode length, nutrient deficiencies etc. It is so important to match a variety with the management style and to a particular soil type in which it will be grown on. There are varieties that do better on lighter sandier soil vs stiff clay-based soil and we always want to know if the variety is more suited for irrigated vs dryland.

Fertility - Managing cotton fertility can be tied closely with variety selection or vice versa. It is pretty obvious that varieties post DP 555 are more sensitive to potassium deficiency. Varieties such as 555 have a long fruiting period, thus extending the potassium demand over a longer period of time vs a variety with a shorter fruiting period that demands larger quantities over a shorter period. This accentuates the need to make sure the potassium is in the soil and available at the time of peak demand. Splitting potassium applications on deep sands is usually something that we wished we would have done or an after the fact thing. The addition of supplemental pot ash is also important if heavy rainfall was received since planting or again farming in deep sandy fields. Many growers use foliar products to address deficiencies with no luck in correcting. Foliar products are meant to maintain and supplement an overall program. We get so many calls to the affect, "my cotton is yellow/red in color and dropping leaves, what do I do." Once cotton gets to this point, it is very difficult to turn it around. This backs up the concept to pull tissue samples while the plant is actively growing and not showing deficiency symptoms, thus allowing the grower the time to deal with the issue at the onset. Unfortunately, many of our foliar products only contain a small of nutrient value with often an expensive price tag.

Inconsistent Scouting or no Scouting – Sometimes it takes a crises to learn the importance of any concept in life. As tropical storm Debby did her damage in cotton fields, it was pretty clear that it was going to be difficult to get ground equipment in fields due to the tangled-up plants. Many growers were due for a stink bug application. As I was dealing with this issue, I found myself really stressing the importance of scouting rather than just making the usual trip across the field that we have gotten so accustomed to doing. The back log of local aerial and drone applicators was great, so that added more pressure to not spray unless absolutely needed. The scouting process involves looking for external and internal boll damage as well as looking for the actual bugs. It does not take many saved applications to pay for the scouting fee.

Nematode Sampling – Dr. Kemerait has educated myself and the rest of us on the need to monitor our soils for the presence of nematodes. Harvest season brings on many management pressures that sometimes cause growers to put nematode sampling on the back burner. Nematode sampling is kind of like scouting, if you don't know if nematodes or insects are present, managing them is impossible. So many of our troubleshooting calls during the summer involve nematodes. Even if it is not the primary cause of the issue, nematodes are at least a contributing factor. I realize the fee to process nematode

samples can be costly, but so is lost crop yield. Knowing this vital information can guide growers to making the correct in furrow treatment, variety selection, and even crop rotation decisions. To manage costs, maybe select certain fields each year, prioritizing trouble ones first and work from there.

These are just a few of the things a grower could consider doing different from year to year, or better said, these are the main things in 2024 that came to my mind as I continue to work in cotton and the rest of the crops.

U.S. EPA's herbicide strategy to protect endangered species is finalized (*Stanley Culpepper and Taylor Singleton*): Last week, the U.S. EPA released the finalized version of the Herbicide Strategy, which outlines the agency's plan to ensure that herbicide registration/reregistration and use complies with the Endangered Species Act (ESA), protecting threatened and endangered species from the use of these products.

The creation of this framework has been a tremendous undertaking by the EPA, over three years in the making – including the public release of (and acceptance of public input on) multiple documents outlining initial thought processes, analysis, potential regulations, and solutions. For the entirety of this process, *Georgia agriculture (UGA Extension, County Agents, GDA, and Farmers) have been engaged and involved*, working closely with the EPA and U.S. Fish and Wildlife Service to provide extensive input and suggestions as these agencies worked together to develop the final herbicide strategy.

Over the last year since the draft framework was released, we have shared with you examples of how these proposed regulations would potentially impact your operation. As presented, the draft framework was challenging to production agriculture in Georgia, essentially eliminating the practical use of herbicides on the farm through increased regulations that weren't compatible with many our production practices and operations. *However, there have been tremendous changes between the draft and final versions, significantly improving a grower's ability to comply and continue using herbicides in a practical manner*. The willingness of the regulatory partners to visit Georgia and put boots on the ground, leaning more about the potential impacts of these changes has been a fruitful process. Thank you for your wiliness to open your farms and share your time to help regulatory partners learn what it takes to remain agronomically, economically, and environmentally sustainable on Georgia farms!

The newly released, and final herbicide strategy now includes many additional options for mitigating potential spray particle drift and surface runoff/erosion of herbicide products, out of the treated field and into the environment. If the product requires that mitigation measures be implemented, there are now numerous options available on the menu of options that would fit well into many Georgia agricultural production systems, *minimizing disruption to current operational practices*. Additionally, the final strategy takes into account land features that minimize movement of pesticides into the environment, including soil characteristics and land terrain. As you learn more about how these practices will fit into your current operation, it will be more critical than ever to ensure you are documenting and keeping records of what you are doing on the farm. More information will be provided at a later date on specific options available and what record keeping must entail.

For farmers, it is very important to understand that **the release of the final herbicide strategy does not change anything right now – there are not new restrictions for applying herbicides today**. This document simply outlines what the process looks like moving forward for the next products moving through herbicide registration and reregistration, and how the need for mitigations is going to be addressed in the future. Now that the final herbicide strategy has been released, this will apply to anything "moving through the pipeline"….meaning the potential for a few new herbicide registrations in the not-so-distant future has likely increased for the farmer.

Let's all agree on one thing, this process outlined by the herbicide strategy is *extremely* complex! But if we *ALL* work together, success will be achieved. Ensuring that pesticides are applied and remain on target has been a priority for Georgia agriculture for more than a decade, and these new guidelines will just further that mission, without undue burden for nearly all of our fields.

Farmers and pesticide applicators, please make the effort to attend Extension meetings throughout the winter to better understand the processes surrounding new ESA compliance for pesticide use, and what your responsibilities will look like moving forward. Again, we must work together to help keep pesticide use practical and sustainable!

Cover crop considerations (*Taylor Singleton*): The end of the growing season is rapidly approaching, so most folks are beginning to think about defoliation and harvesting….all while praying the tropics stay "quiet". Something else to keep in mind as you go throughout the next couple months are any plans to follow cotton with a cover crop. Using a cover crop after harvest and before planting the next crop offers an opportunity to reduce erosion, enhance soil health (organic matter, infiltration), and enhance weed control. **Additionally, implementing cover crops with residue that persists into the next cropping season is an excellent way to minimize the movement of pesticides out of a treated field and into the environment…..which has tremendous implications for ensuring compliance with future ESA regulations on pesticides!** (*See U.S. EPA Herbicide Strategy article in this newsletter*).

If you're an experienced cover crop user, you know that planting cover crops is more than just throwing some seed out – it requires a complete rethinking of how you approach your production system. Depending on your current practices, it *may* require a change in timing, logistics, and priorities surrounding fertilization, equipment, weed management, planting, and harvesting. If you're new to cover crops and interested in trying some out on your operation, its best to ease in slowly on a small area until you are comfortable with the changes. Some things to keep in mind:

1. **Understand goals** – Clarify what you want to achieve through using cover crops, whether its mitigating erosion/runoff, suppressing weeds, boosting soil health, or just keeping the soil covered during the offseason.
2. **Start small** – Try it out on a small area to begin with and increase your acreage as you get more comfortable. If you have a small field that you see often or have an area that's prone to

erosion/runoff/leaching this is a great place to start. To really get a good understanding of how to make these practices work, it's most helpful to be able to closely observe the site throughout the year.

3. **Easy entry points** – If you can, pick a field that will allow you to have "extra time" to plant and manage your cover crop. This might be a field that you harvest first or plant later…giving you some wiggle room in the "in-between crops" period that improves flexibility and helps you see what needs to be adjusted for next time.
4. **Select compatible species** – Considering what crop you are planning to plant next, keep species selection simple to begin with. Rye/oats/other small grains are a great place to start (*cheaper $*), before trying more complex species mixtures (*more expensive $$$*). Match the species to the goals you want to achieve (ex. weed control = high biomass cover crop, etc.).
5. **Understand agronomic practices** – Once you select your species, adjust your seeding rates based on your planting method (broadcast vs drilled). Keep an eye on the weather and hold off on planting until adequate soil moisture is present. Overseeding into standing cash crops (before harvest) is an option, however this will introduce another level of complexity that must be considered (cash crop maturity, potential for seed to reach the soil, etc.). Drilling the cover crop will provide the best seed to soil contact after the cash crop has been harvested.
6. **Understand termination** – In the spring, don't let termination slip up on you….understand when the cover needs to be terminated based on the relationship between the cover crop species selected and the upcoming cash crop. When the cover is terminated will influence how much biomass/residue remains when its time to plant the cash crop, so keep equipment considerations in mind and level of comfort when starting out.

Please plan to attend extension meetings to learn more about cover crop work being done around the state. We are working on compiling and building additional cover crop resources, so if there is something you need, please don't hesitate to reach out to your county agent. Best of luck for a productive and safe harvest!

Important Dates:

J. Phil Campbell Cotton Field Day – Watkinsville, GA – September 24, 2024
Georgia Cotton Commission Annual Meeting and UGA Cotton Production Workshop - Tifton, GA – January 29, 2025