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Fixing Soil Fertility Problems: Too Late for This Year but Early for Next Year? (*Glen Harris*): A cotton grower in Dodge county told me years ago that once the leaves of the wild muscadine plants (he called them “bullaces”) turn “yella” then it’s game over and time to stop foliar feeding cotton. He might also have said “it’s just time to grease up the picker” (or I added that I can’t remember). The “bullaces” in my yard in Tifton are definitely “yella” right now. It’s frustrating when county agents and others call me this time of year and say they have a pH problem...or a potassium problem... or “I think I ran out of nitrogen problem”...because frankly it’s just too late to fix these problems for this year’s crop. But just like when a sports team that has a less than stellar season...we can learn from the past, identify our weaknesses, come up with a strategy for fixing problems and “Let’s get them next year!”

So even though it may be too late for this year it’s not too early to work on next year. The first step is identifying or pinpointing the exact soil fertility issues you are having. Is it a potassium problem or a pH problem? Or both? Are there other problems that are preventing the uptake of fertilizer nutrients you apply, like nematodes, or maybe soil compaction? But I put out plenty of potassium fertilizer and I still got cotton “rust”, Stempyhlum leafspot and dropping my leaves. I hear this one more often than you would think.

Of course, good soil sampling is the first step when trying to head off problems for next year. Grid sampling on 2.5 acre grids should go a long way to catching most problems like pH and potassium. Grid sizes larger than 2.5 acres are not considered to be effective and will likely not pick up problems you see in patches across a field. For weak areas smaller than 2.5 acres you may consider identifying these areas now and soil sampling them separately since they may not be picked up with 2.5 acre grids.

One day we will get precision and ag and variable rate nitrogen application on cotton nailed down. But for now, fertilizing N by yield goal (increasing rates with increasing yield goals) and split applications (1/4 to 1/3 at planting and the remainder at sidedress) is still a good strategy to avoid running out of N late in the season. Petiole testing during the late bloom period can also help determine if and when your N “crashes”. Overall, we seem to have less nitrogen problems on Georgia cotton than potassium. And phosphorous deficiencies in Georgia cotton are pretty rare.

If I had to pick one soil fertility problem that I have gotten the most calls on during my career at UGA Tifton it would have to be pH. And one pH issue that seems to be becoming more and more of a problem is false high soil pHs when samples are taken when wet during the winter. This is due to the salt leaching out and affecting the measurement for any lab measuring pH in water, which is most labs except for the UGA lab in Athens. So the phone conversation usually goes something like this: “I took a soil sample in January when it was wet and it said I had a pH of 6.3 but now in June, my cotton is stunted and yellow and it says I have a pH of 5.5. Did it really drop that much?” Me: “No, the 6.3 was a false high and it was probably somewhere less than 6.0 and you would have limed. But you didn’t think you needed to so you didn’t and now we have a pH problem.” Believe it or not, if you catch this problem early enough, maybe around squaring you still may be able to rescue it with fine lime or maybe even regular lime. But of the bullace leaves are turning yellow, well.....

Managing Late Season Nutrient Deficiency in Cotton (*Henry Sintim and Glen Harris*): In the August 2023 UGA Cotton Team 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 bolls, 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.

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 pivot is the most convenient and efficient at this point of the season. Care must be taken when using foliar application to avoid causing significant leaf burn.
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 significant 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.
6. **Consult Experts:** Seek advice from extension services and agricultural experts for tailored nutrient management plans.

Conclusion:

Late-season nutrient deficiency in cotton is a challenge that can impact crop 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.

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Importance of End of Season Irrigation Termination and Disease Control in Cotton (*Bob Kemerait, 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. On average, 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. While Hurricane Idalia brought some needed moisture during the last week of August to parts of the state (and some not needed damage and wind), we are predicted for low chances of rain over the next few weeks. 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. While the eastern region of the state benefited from Idalia, there are many areas in the western portion that are still very dry. 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. Most areas of the state should have at or near a full moisture profile from Idalia. In addition to this storm, we have another storm as I write this that is predicted to move across the Caribbean early next week and head towards the Atlantic coast and we cannot be certain at this time of its path. This time of year, is always unpredictable and all we can do is the best we know how in preparing for these events.

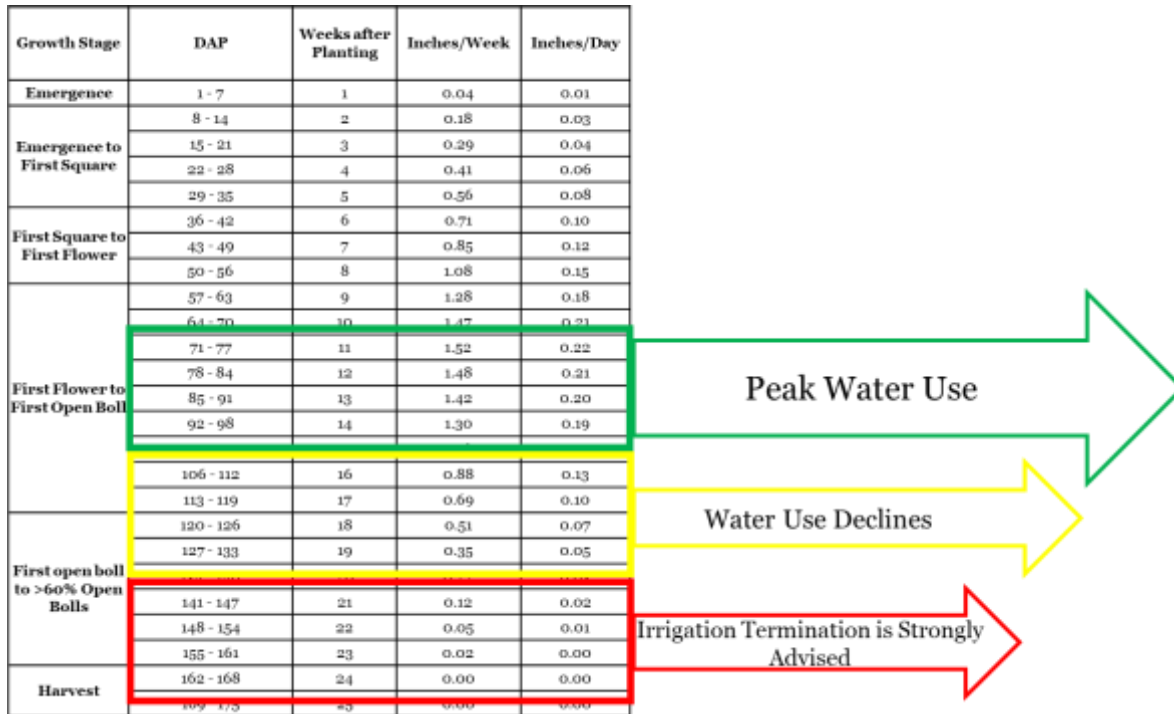


Figure 1. Seasonal cotton water usage with peak, decline and irrigation termination highlighted.

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. 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.



Figure 2. Boll rot picture courtesy of Dr. Bob Kemerait

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

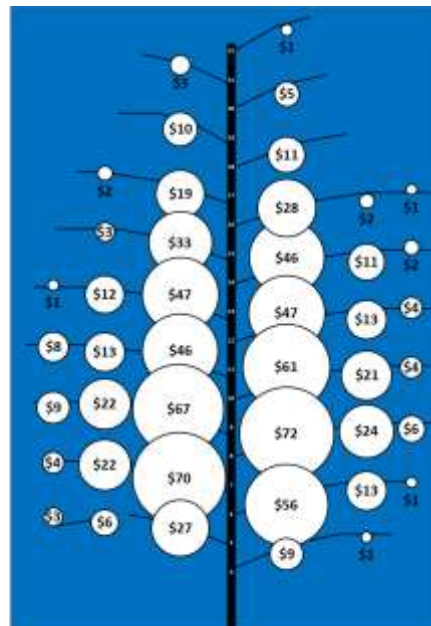


Figure 3. Boll position and value of boll position along the cotton plant, courtesy of Whitaker (2019).

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. If you have questions about finalizing irrigation make sure you reach out to your local UGA County Extension Agent.

Late Season Management Considerations for Diseases and Nematodes in 2023 (Bob Kemeraït): We are about to hit the “short rows”. Though the 2023 season is not over yet, it will not be too much longer until pickers are in the field and modules and round-bales fill the gin yards. This season it has not been unusual to find fields adversely affected by nematode damage, target spot, areolate mildew, and, on occasion, bacterial blight and Fusarium wilt. At this point in the season, growers with more than a month to go until they defoliate should keep protecting against areolate mildew with a fungicide application an option. Not every cotton field in Georgia needs to be protected against areolate mildew, but some do. Already there are examples of fields where areolate mildew has caused tremendous damage because the crop did not receive a timely fungicide application. You cannot go back and fix that.

There are seven significant disease/nematode conditions present in Georgia’s cotton fields now for which there is not much growers can do. Effective management for some could only have occurred prior to closing the furrow. Still growers should pay attention and note these issues in their fields so as to make the best management decisions in 2023.

1. Stemphylium leaf spot is present in many 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. Stemphylium only 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. Grower should take special steps to manage soil fertility (and nematodes) to reduce losses to this disease. Fungicide applications are not effective to reduce losses associated with Stemphylium leaf spot.
2. Target spot has not been especially severe in most fields this season, but it has been present. As 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 protected their cotton crop with fungicides in 2023 were justified in doing so, especially as this treatment also protects against areolate mildew. A fungicide application after the 6th week of bloom is not needed for management of target spot; however growers should still note if this disease is a problem and prepare for next season.

3. Areolate mildew has been problematic again across a large section of the cotton production region of Georgia. Growers should consider protecting against areolate mildew to within a month of defoliation. Priaxor and Miravis Top offer excellent control; Headline offers good control, and azoxystrobin offers fair-to-good control.
4. Bacterial blight became established in some fields very early in the season and always on susceptible varieties. Statewide, bacterial blight has been a very minor issue in 2023, demonstrating that the development and spread of a disease can be difficult to predict. Growers are reminded to be careful in their selection of varieties for 2023 as resistant varieties are the only measure for managing this disease.
5. Fungal boll rots are once again present in some fields this season. Fungicides, unfortunately, are not an effective management tool for control of boll rot.
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. Nonetheless, at this point 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. Again, we should have some excellent data to share after this field season.
7. Nematodes in general (root-knot, reniform, sting and lance) are a significant problem in our cotton fields. Growers are encouraged to take the 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. This information will help to develop a management plan in 2024.

Taking stock of disease and nematode issues at the end of the 2023 season should help growers to make effective management decisions for 2024.

Weather and Climate Outlook for September 2023 (Pam Knox): The beginning of September looks a lot calmer than the end of August with the passage of Hurricane Idalia through parts of Georgia last week. While commercial crops like cotton and peanuts have had some damage, a lot more damage occurred to pecans due to extensive nut loss and many trees that were blown over. I am interested in hearing about damage you may have had so I can add it to my report to the Southeast Regional Climate Center.

September is starting out warm and dry. Rain should increase in the second week, but temperatures are likely to remain above average, although the clouds associated with the rain may cool things off a bit. Later in the month, there is no clear signal of how much rainfall we will get. It is not unusual to get a dry spell in fall, but that depends in part on the tropics and also on what is happening with the large-scale

weather pattern to our west. The long-term fall temperature trend indicates that we are more likely to see above-normal temperatures than below-normal conditions.

After Hurricane Idalia, we have returned to quiet conditions for now. There has been a lot of activity in the Atlantic, but most of the storms have stayed out to sea and have not affected the Southeast. The next area of interest is currently called Investigation 95 and it is located in the eastern Atlantic. It has a 90 percent chance of becoming Tropical Storm Lee in the next seven days as it heads generally in our direction. However, the current computer models indicate that it is likely to turn north before it gets to the United States, although some model runs indicate it could clip Puerto Rico. It is too early to be concerned about TS (and likely Hurricane) Lee since it must cross most of the Atlantic before it gets near enough for us to take any action. By the end of the second week of September, we should have a much better sense of where it is, how strong it has become, and where it is likely to go, and that should be enough time to respond if needed. Keep in mind that we are in peak hurricane season from now until late October, so it would not surprise me if we saw more tropical activity later in September or October that could affect us, although there is nothing specific in view at this time.

El Nino is on the verge of being declared a strong event. That means that we can expect more rain than usual this winter, especially in southern Georgia where most of the commodity crops grow. In a strong El Nino, the winter rain sometimes starts early, so you will need to watch the weather forecasts carefully to make sure you harvest at a time when rain won't impact your fieldwork or decrease the quality of your harvest.

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). The last effective bloom date to mature a harvestable boll varies from year to year but generally is somewhere between September 1st and 15th. 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
Stink Bugs	25 bolls fully sized and difficult to burst
Sucking Insects whiteflies aphids	harvest (honeydew accumulation on lint)

Defoliate in a Timely Manner to Manage Silverleaf Whitefly Populations and Preserve Yield and Fiber Quality (Phillip Roberts): Silverleaf whitefly (SLWF) infestations are present in some areas and some acres have required treatment. As a whole SLWF have yet to blow up to high numbers. As in previous years, SLWF infestations are highest in areas which grow both cotton and vegetables. In these areas crops which SLWF feeds and reproduces on are grown 12 months out of the year. The primary cropping systems that drive overall SLWF populations in Georgia include:

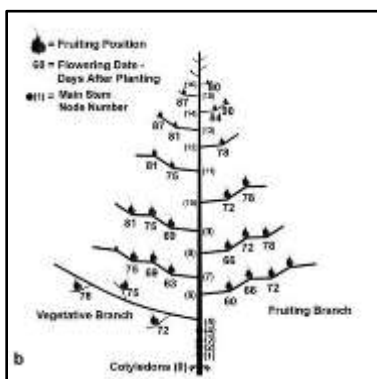
1. Winter vegetables such as cabbage, collards, and kale.
2. Spring vegetables including cucurbits (cantaloupe, cucumbers, watermelons, and squash) and fruiting vegetables (tomato and egg plants), and others.
3. Agronomic crops such as cotton and soybean.
4. Fall vegetables which include a similar crop mix as spring vegetables.

Management of SLWF in these individual cropping systems affects infestations in subsequent crops as SLWF move from one cropping system to the next. Failing to properly manage SLWF in any one of these systems can have negative consequences for subsequent cropping systems. It is important that we properly manage SLWF in all cropping systems to manage the overall SLWF population. The SLWF population is somewhat like a snowball and just grows larger and larger during the summer. Have you ever considered how many SLWF are produced per acre if we defoliate 1, 2, or 3 weeks late? Timely defoliation will also lower the risk of having fiber quality problems related to whiteflies. Ultimately how we manage SLWF now will have impacts on us in 2024. Keeping in mind that SLWF requires management until harvest, one of the best practices is to defoliate in a timely manner. For more information on this subject see the following publication: *Cross-Commodity Management of Silverleaf Whitefly in Georgia* at the following website: https://secure.caes.uga.edu/extension/publications/files/pdf/C%201141_1.PDF

Review of Cotton Physiology (Wade Parker and John Snider): As we make recommendations pertaining to cotton or any other crop, physiology is sometimes taken into consideration. With regards to cotton, we often hear the terms: node of first fruiting branch, total nodes, nodes above cracked boll, and nodes above white flower. As defoliation time nears, nodes above cracked boll is a popular method of

determining when to defoliate, and nodes above white flower helps us determine when the plant has reached physiological cut-out. While many of our extension agents are well versed with these terms, the following is a quick review for those that aren't.

How do I count the total nodes of the plant? This can be tricky and requires paying close attention. The first step in counting is finding the cotyledons. By the middle of the season, the cotyledons are usually not attached to the stem. Whether they are still intact or not, cotyledons are always counted as node zero. If the cotyledons are not attached, then look or feel for the two scars that should be directly opposite of each other near the base of the main stem. As you move past the cotyledons, pay close attention to scars above where the cotyledons were. The next scar or leaf tissue above the cotyledons is "one" followed by "two" (alternating up the main stem) until you start seeing leaves with fully developed petioles or until you start seeing branches. The nodes then turn into stairsteps and are fairly easy to count from there. Keep counting until you get into the terminal of the plant. The last node to count when counting total nodes is the uppermost node with an unfurled mainstem leaf (quarter size leaf) attached to it. The diagram below illustrates my description of node counts:



Cotton Growth and Development, UGA Extension – June 2007

Node of first fruiting branch: Learning how to identify the node of first fruiting branch tells us needed information about a particular variety. As you begin counting nodes, usually the first fully elongated branch is referred to as a vegetative branch. If you were to pull the entire vegetative branch off the stem, it would look like a miniature cotton plant. The first fruiting branch will be present above the vegetative branch/branches. Fruiting branches can be distinguished from vegetative branches because they will have reproductive structures (squares, flowers, or fruit) attached directly to the fruiting branch rather than being attached to secondary branches. Varieties that begin producing fruiting branches on lower mainstem nodes (5 for example) tend to be earlier maturing. Conversely, if a variety starts fruiting on node 7, it is more than likely a mid or full season variety. More aggressive growing varieties tend to start fruiting on higher nodes as well.

Nodes above cracked boll: This term or phrase is used a lot to determine defoliation timeliness. First, identify the uppermost first position cracked boll in the plant. Then count the number of main stem nodes until you reach the uppermost harvestable boll. If this number is 4 or less, it could be time to defoliate.

Keep in mind, this is one tool in the tool box for defoliation determination. Other approaches that should also be utilized along with the previous approach include percent open boll estimates (% open boll greater than 60%) and boll maturity estimates (slicing bolls to determine if fiber strings out and seed is mature).

Nodes above white flower (NAWF): This refers to simply counting the mainstem nodes above the uppermost first-position white flower. In many cotton production regions in the Mid-South, the cotton crop is considered at physiological cutout if this number is 5 or less. In long growing season environments such as south Georgia, using NAWF = 3 as the definition of cutout is considered a safer option. New vegetative growth and development will slow down or stop completely. This is very important to know as a grower makes current or future input decisions.

There are many other terms used in cotton growth and development, but these are the most frequently used in a growing season. I recommend reading the publication, "[Cotton Growth and Development](#)," a UGA Extension publication. This is an easy to read publication that provides a solid explanation of cotton growth and development. Hopefully, when you hear the phrases used in this article, you will more fully understand what it is the person is referring too and how to interpret the information.

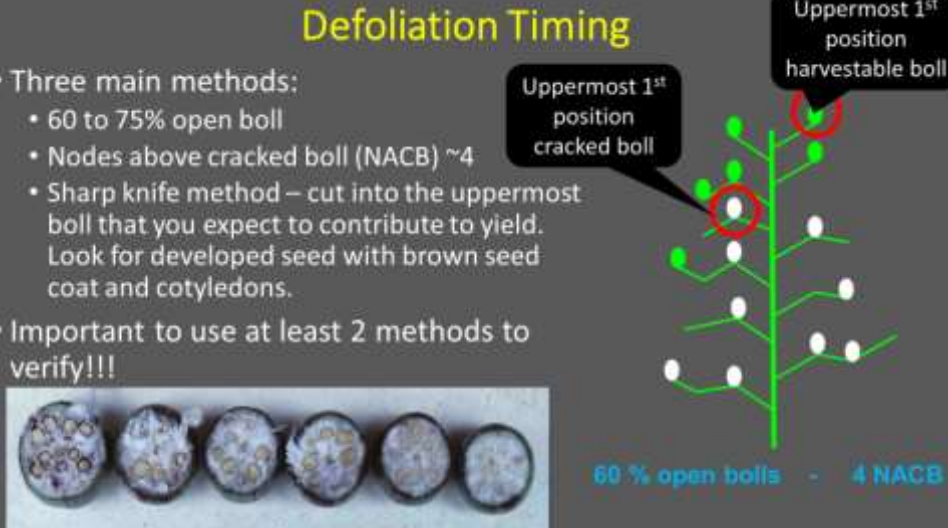
Defoliation and Other Considerations for September and Beyond (*Camp Hand*): As we roll into September, it is time to start thinking about defoliating our cotton crop. As I have driven around the state in the last couple of weeks, I have already seen a number of fields ready to defoliate. This crop looks really good. Let's maximize yield and quality by getting out there when the crop is ready, and defoliating/harvesting in a timely manner.

There are a few things I have been talking about as I venture around the state talking about defoliation, and some of the high points are below:

1. Make sure the defoliation "trigger" is pulled at the right time. There are many ways to determine the appropriate time to defoliate your cotton crop – 60 to 75% open boll, 4 nodes above cracked boll (NACB), and the "sharp knife" method. It's always good to use two methods to determine the correct timing as a way to double check yourself. To determine % open boll, count the number of open bolls, the number of unopened (harvestable) bolls, divide the number of open bolls by the total bolls and multiply by 100. For NACB, count the number of nodes from the uppermost first position cracked boll to the uppermost first position harvestable boll. When that number is 4, on average you are good to pull the trigger. And lastly, for the sharp knife method cut into the uppermost boll you intend to harvest and look for a black seed coat with developed cotyledons inside, and you want the lint to string out.

Defoliation Timing

- Three main methods:
 - 60 to 75% open boll
 - Nodes above cracked boll (NACB) ~4
 - Sharp knife method – cut into the uppermost boll that you expect to contribute to yield. Look for developed seed with brown seed coat and cotyledons.
- Important to use at least 2 methods to verify!!!



2. Make sure you are using the correct products and rates to accomplish your intended goals. There are 3 main goals in defoliation – leaf removal (juvenile and mature leaves), regrowth prevention, and boll opening. Determining which goals you are trying to accomplish, as well as the environmental conditions surrounding defoliation, will assist in the decision on products and rates. For regrowth control and juvenile leaf removal, thidiazuron containing products will be needed in the tank mix. Thidiazuron alone is available under many trade names (Dropp, Freefall, Klean-pik, etc.), and there is also a premix of thidiazuron + diuron (Ginstar, Cutout, Adios, etc.). Mature leaf removal can be accomplished with a number of products. The main one utilized in Georgia is Folex (tribufos), but there are a number of PPO inhibiting herbicides that can be utilized as well (Aim, ET, Sharpen, Reviton, Display, Blizzard, Resource). Lastly, your boll opening products contain ethephon. Whether it is ethephon alone (Boll Buster, SuperBoll, Setup, etc.), ethephon + urea sulfate (Cotton Quik, First Pick), or ethephon + cyclanalide (Finish), these will all open bolls.

The most common tank-mixture utilized by Georgia growers includes thidiazuron (Dropp), tribufos (Folex), and ethephon (Prep). Below is a table to assist in rate selection for each product from early to late season.

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	8 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 boil 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

For ethephon and tribufos, as the season progresses and it gets cooler, rates should increase to get the desired effects. Whereas once we get to the end of the season, thidiazuron is removed from the tank-mix because as it gets cooler outside there is a lower risk of regrowth. Keep in mind that you can substitute tribufos for any of the aforementioned PPO inhibiting herbicides, and I would follow the same trends with rate selection (lower rates when it's warmer outside, increase as it gets cooler). Recommended rates on each product discussed here throughout the season can be found beginning on page 143 of the 2023 UGA Cotton Production Guide, which is at the following link: <http://www.ugacotton.com/production-guide/>. Also, I will be in constant contact with our UGA County Extension agents throughout defoliation and harvest season, so if you have questions about products or rates feel free to reach out to your local UGA County Extension Agent.

- Mo' water is mo' better. A higher sprayer output (gallons per acre) works better than a lower sprayer output with respect to defoliation (even if you decide to use dicamba nozzles). Let's shoot for 15 GPA if you're defoliating with a ground rig to get defoliant down in the canopy.
- KEEP DEFOLIANTS ON TARGET!!!!** I have talked about this a lot in the last few years. It is imperative that we apply all pesticides responsibly, let's not forget that at the finish line. Keep the lessons from Using Pesticides Wisely trainings at the forefront of your mind as we apply all pesticides, including defoliants. Keep in mind what is around your fields, the wind speed and direction at the time of and after application, keep the spray booms 24" above the crop canopy, and use nozzles that produce larger droplets with a higher spray output. It is important from the aspect of reducing pesticide drift in general, but also from the standpoint of protecting the chemistries we use.
- Timely defoliation and harvest are key to producing a high quality crop. Only defoliate what you can come back and harvest in about 10 to 14 days. This helps preserve crop quality and can reduce

the likelihood of an extraneous matter call. And speaking of extraneous matter, handle your modules carefully and be sure to get grocery bags/balloons out of your field prior to harvest to reduce the likelihood of plastic contamination. It's a 2X deduction from the classing office and our friends at the gin don't like plastic. Let's do our part to reduce plastic contamination.

Common questions this week:

Since Hurricane Idalia passed through, there have been a few questions come through on the response of the crop and things we can do. There isn't much we can do at this point except wait and see how the crop responds (keep in mind it has only been a week), but there are some things we have seen in response to the storm.

1. Some of the cotton leaves are turning red. In some cases this is just the plant showing its age and preparing for the end of the line. This is going to help us out come defoliation time. In other cases, as pictured below, we are seeing this where plants were blown around during the storm and the underside of the leaves is turning red in response to being exposed to the sun. Some other cases may be caused in response to the plant still being in waterlogged soils.



Pictures of the underside cotton leaves turning red in response to sun exposure from Hurricane Idalia.
Courtesy of Tucker Price, Cook Co. ANR Agent.

2. Some cotton in weaker spots in a field are prematurely defoliated after the storm, while stronger parts of the field look fine. This is likely in response to potash deficiency. Leaves in the weaker spots did have stemphylium leaf spot and typical potash deficiency symptoms. Nothing to do now except wait for the better parts of the field to mature then pull the trigger on defoliation.



Pictures of normal (left) and defoliated cotton due to potash deficiency (right) following Hurricane Idalia. Courtesy of Ben Reeves, Berrien Co. ANR Agent.

3. Will spraying mepiquat chloride (aka Pix) help this younger, twisted up cotton stand up?? Answer – **NO!!!** Mepiquat chloride has one simple function, and that is to shorten internode length in an actively growing cotton crop. I have gotten this question multiple times, I have been asked about using it in defoliation mixes to help with regrowth, and other crazy ideas as well. I'm not sure where the notion came from that Pix is a "cure-all", but it only shortens the internode length of actively growing cotton.

I hope that everyone has a safe and prosperous defoliation and harvest season. As always, if you ever have questions or need anything please don't hesitate to reach out to your local UGA County Extension Agent. They, along with us specialists, are here to help!

Important Dates:

J. Phil Campbell Sr. Research and Education Center Cotton Field Day – September 27, 2023
Georgia Cotton Commission Annual Meeting and UGA Cotton Production Workshop - Tifton, GA – January 31, 2024