UNIVERSITY OF GEORGIA EXTENSION

UGA Cotton Team Newsletter
April 2022

Articles in this month's issue include:

The Importance of Preplant Fertilizer – Don't Delay or Cut Out N, P, or K (*Glen Harris*): Ok, we all know that fertilizer prices are high right now. But so are cotton prices. And you are thinking about cutting back on how much N, P and K you put out. However, if you cut back on fertilizer you may cut back on yield and fail to cover your budget. If you attended a county meeting this winter you heard me talk about how, believe it or not, it still pays to fertilize cotton (and corn) for a realistic yield goal. I also covered other things to consider such as banding P&K, in-furrow fertilizers, chicken litter and other fertilizer "by-products". But there are no silver bullets. If you missed this information you can view the video recording of it on ugacotton.com/presentations.

Something that came up right at the end of the meeting season was about timing of fertilizer applications. You may have heard about the "4Rs's of fertilization", i.e. having the right rate, source, timing and placement. In my opinion there is too much emphasis placed on rate and not enough on the other three. For example, related to timing I've heard some are recommending not applying any nitrogen at planting. This would go against our UGA Extension recommendations and could end up reducing cotton yields (again making it hard to meet your budgets at the end of the year). So lets take a quick look at the timing of N,P and K fertilization on cotton:

Nitrogen – The UGA Extension recommendation is to split apply nitrogen where you put ¼ to 1/3 of your total N rate at planting and then the remainder at sidedress. Preplant nitrogen is important for early growth and to get off to a healthy start. If you do not put any preplant nitrogen out you are going to automatically reduce your yield potential. By how much depends on a number of factors such as soil type and residual

nitrogen present. In some cases it might not hurt you that much…but in others it could get you behind and you can never catch up or regain that yield potential.

Phosphorous – is important for early seedling root growth so it makes sense it needs to be applied preplant. In fact, if you get more than 30 or 40 days after planting cotton and have not applied phosphorous when need it is probably too late and again yield potential will suffer.

Potassium – Even though a cotton plant does not need a lot of potassium early on (and is one of the reasons we usually do not include K in a cotton starter fertilizer), research studies have shown that applying all your potassium "up front" or close to planting, followed by foliar K during peak bloom is more effective for avoiding potassium deficiency than "split applications" (some at planting and some at sidedress). Potassium is just not the same as nitrogen and does not need to be split applied like nitrogen does.

So in summary, all the recommended P and K should be applied pre-plant or at planting and enough nitrogen to get off to a good start and get you to sidedress time. Around 30 lbs N/a is preferred at planting but don't cut back past 20 lb N/a at planting, and if you do, be ready to go a little earlier with your sidedress application, that is closer to first square than first bloom.

A Pre-Season Checklist for Diseases and Nematodes of Cotton (*Bob Kemerait*): The 2022 cotton season is upon us and some of the most important decisions growers can make to protect their crop from nematodes and diseases can only be made BEFORE the furrow is closed. Once the furrow is closed, the grower watches from the sidelines as the cotton crop battles nematodes, seedling disease, Fusarium wilt, and bacterial blight. The most important tactics to protect a cotton crop from these maladies are over when the furrow is closed.
Seedling diseases are a significant threat to cotton production in Georgia and will result in significant stand loss if not effectively managed. The vast majority of seedling diseases are caused by fungal pathogens, especially *Pythium* (pre-emergent damping off) and *Rhizoctonia solani* (post-emergent "soreshin"). Key tactics to minimizing risk to seedling diseases include:

1. Avoid planting into soils that are not 65°F or warmer.

2. Do not plant if wetter and cooler temperatures that could significantly drop soil temperatures are in the forecast in the upcoming 7 days.

3. Ensure that seed is adequately protected with a seed treatment that included a combination of fungicides to protect against Rhizoctonia, Pythium, and other fungal pathogens.

4. When growers will plant into a field where risk to seedling disease is increased, e.g. short cotton rotations or conservation tillage, consideration should be given to use of additional seed treatments or in-furrow fungicides.

Nematodes will always be a threat to cotton production in Georgia. Decisions made at planting could easily be the difference between a profit and a loss in a specific field or in multiple fields. Key tactics to protecting a crop against nematodes include:

1. Consider rotation with peanuts to reduce risk to nearly all nematodes that affect cotton. Planting corn in rotation with cotton can reduce risk to reniform nematodes.

2. Pull soil samples at harvest in the previous season to have a "heads up" for the types of nematodes and the population size of parasitic nematodes waiting for the next cotton crop. Knowing "what" and "how many" will allow growers to make the most informed decisions.

3. Where a field is infested with southern root-knot or reniform nematodes, growers should recognize that they have the opportunity to plant resistant varieties. A nematicide is not needed where root-knot nematode varieties are planted in a root-knot infested field. It is unlikely that nematicides will be needed when a reniform nematode resistant variety is planted into a reniform-infested field. If sting or Columbia lance nematodes are present, resistant varieties are not available and the only management tool is to use a nematicide.

4. Where a resistant variety is not planted into a field infested with plant-parasitic nematodes (southern root-knot, reniform, sting, or Columbia lance), growers are advised to consider using a nematicide to protect the crop. Fumigation with Telone II (3 gal/A) is the most aggressive treatment. Next would be AgLogic 15G (5-7 lb/A) and Velum (6.5-6.8 fl oz/A) followed by nematicide seed treatments to include Copeo, Avicta, and BIOst.

Fusarium wilt is a serious problem in specific fields. Fusarium wilt results from the interaction between the Fusarium fungus and nematodes which damage the cotton crop. The damage from the nematodes allows the fungus to infect the roots of the cotton plant. To best manage Fusarium wilt disease, growers must effectively manage nematodes in the field, often with a nematicide.

Bacterial blight has not been a significant problem in Georgia over the past few years; however this disease can cause yield loss in specific fields. The only effective management strategy for bacterial blight is to plant a disease-resistant variety.

Approximately five months after cotton is planted, the cotton is harvested. Five months is a long time. But five months can seem even longer if the crop is not adequately protected from diseases and nematodes on the day that the furrow is closed. Make your decisions carefully.

Weather and Climate Outlook for April 2021 (*Pam Knox*): April is expected to be warmer and drier than usual across most of the Southeast in 2022. This continues the pattern seen in the past few months that was caused by a combination of the current La Niña and the trend towards warmer temperatures observed since the 1970s. The last few Aprils have been cooler than the trend would indicate, but with the continuation of La Niña and a look at the mid-range climate forecasts, I don't expect this to happen again this year. There is some indication of a couple of cooler periods within the month, but generally above normal temperatures are expected in most weeks.

While the April monthly precipitation is expected to be drier than usual, several frontal passages will move through the state during the next few weeks. Each one will bring the potential for severe weather as well as the chance of rain. The soil has been relatively dry over the past month, but the recurring rain should help with soil moisture. You will need to watch the forecasts carefully to determine when the best time to get into the fields is likely to be.

La Niña is currently still present in the Eastern Pacific Ocean and is contributing to the current weather pattern. It is expected to weaken and return to neutral conditions by early summer, although forecasts in spring are less reliable than those later in summer. With neutral conditions in place over the summer, we are expected to have another relatively active Atlantic hurricane season. Of course, there is no way to predict where those storms will go, and so there is limited planning you can do for the tropical season at this point. There is a long-term tendency for the summer after a La Niña to have an increased chance of drought, but that certainly did not pan out last year due to the active tropical season so I am hesitant to say we will have one this year. It will largely depend on whether we have tropical moisture over our area or not, since 30 percent or more of summer rainfall comes from tropical systems and if they go elsewhere, we are much more likely to experience drought conditions.

Thrips Management: Use an At-Plant Insecticide (*Phillip Roberts*): Thrips are consistent pests of cotton, infesting nearly all cotton acres planted in Georgia each year. Thrips are the only insect pest of cotton that a preventive insecticide is recommended. We consistently observe a positive yield response to at-plant insecticides used for thrips control. A reactive approach based on scouting and use of thresholds is recommended for less consistent insect pests such as stink bugs, corn earworms, whiteflies and others to maximize profitability. With most insect pests there are agronomic and management practices which influence the risk and severity of infestations. Below are a few thoughts to consider as you make decisions for your at-plant thrips management program.

1. Use a preventive insecticide at planting. Thrips will infest near 100 percent of cotton planted in Georgia. We consistently observe positive yield responses in UGA research and on the farm when an at-plant insecticide is used for thrips control. It is not feasible to control thrips with foliar sprays alone; multiple foliar sprays applied in a very timely manner would be required.

2. At-plant insecticide options include infurrow granule applications of aldicarb, infurrow liquid applications of imidacloprid or acephate, and commercial seed treatments of imidacloprid,

thiamethoxam, and acephate. Infurrow applications of aldicarb, imidacloprid, and acephate tend to provide greater control and longer residual control compared to seed treatments.

3. Thrips infestations are generally higher on early planted cotton compared with later planted cotton. High risk planting dates for thrips injury is a moving target from year to year. The **Thrips Infestation Predictor for Cotton** (http://climate.ncsu.edu/CottonTIP) is a web-based tool which predicts thrips risk by location and planting date. This tool was developed by researchers at North Carolina State University and has been verified using thrips data from Georgia. The website has information about the tool and also includes a link to a presentation describing the tool and how it can be used in the "About" tab. If the risk is high for thrips on a given planting date, consider using a more active at-plant insecticide or be prepared to scout and potentially make a timely foliar spray if a seed treatment is used.

4. Thrips infestations are significantly lower in reduced tillage production systems compared with conventional tillage. In general, the more cover or residue on the soil surface the greater the reduction in thrips.

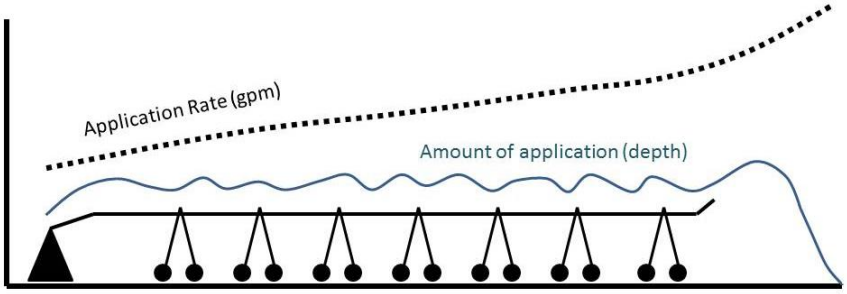
5. Cotton seedlings are most sensitive to yield loss from thrips feeding during early stages of development. Excessive thrips feeding and plant injury on 1-2 leaf cotton has a greater yield penalty than cotton infested at the 3-4 leaf stage. Once cotton reaches the 4-leaf stage and is growing rapidly, thrips are rarely an economic pest.

6. Slow growing seedlings are more susceptible to thrips than rapidly growing seedlings. If cotton is slow growing due to herbicide injury, cool temperatures, or other stresses, be sure to scout for thrips and thrips injury. Thrips feed in the terminal bud on unfurled leaves so more feeding occurs on each unfurled leaf if the plant is growing slowly.

7. Scout for thrips and injury early. The threshold for thrips is 2-3 thrips per plant with immatures present. The presence of immature thrips suggests the at-plant insecticide is not providing control (i.e. thrips eggs were laid on the plant, eggs hatched, and immature thrips are surviving). Immature thrips are crème colored and lack wings whereas adults will typically be brown with wings.

Irrigation System Prep and Early Season Water Requirements for Cotton Production (*Wesley Porter, David Hall, Jason Mallard*): We are moving into the time when cotton planting is beginning, countless hours and many dollars have been spent on tillage, spraying and planting equipment to be prepared for another year. However, make sure that you do not overlook one of your largest investments and one that is just as important as any other, your irrigation systems. Now is an optimal time, if you have not already done so, to do routine and preventative maintenance on your irrigation systems to ensure they are in top shape. There are two important actions that need to be performed before you begin planting your cotton. The first one is an overall irrigation system check and the second is specifically focusing on water application uniformity of your system. First, look up the Spring Center Pivot and Lateral

Irrigation System Preparation | UGA Cooperative Extension (B1452) and go through the checklist that includes all main components on your irrigation system to ensure that they are working properly. Some of these components can include but are not limited to the power unit, pumping system, pipes and drains, electrical systems (which includes cellular connections for remote monitoring and GPS), safeties, tires, gear box oil level and leaks, and the switches on the auto stop feature. Once you have checked all of these components, start the irrigation system and finish checking components by documenting any clogged or partially clogged nozzles along with any visible leaks. Also, check the line pressure, flow, sprinklers, end gun arc travel and booster pump operation. A reduction in pressure and GPM from last year or brass and excessive sand in the trap may be a good indication of potential well issues. An example of the system flowrate and application rate for a center-pivot irrigation system is represented in Figure 1. It is important to remember that due to increasing travel speed as we move towards the end of the pivot, the system flow rate (represented as dashed black line) will go up, but the application depth (represented as solid blue line) should remain consistent. This is achieved with properly sized sprinkler packages.



Application Rate and Depth

Figure 1. Application rate and depth across a pivot tower.

It is important to note that it can be very difficult to detect differences between individual sprinklers and banks of sprinklers on a pivot visually so it is strongly recommended that an application uniformity test be performed on the center pivot to detect any discrepancies along the tower length. A UGA Factsheet titled Evaluating and Interpreting Application Uniformity of Center Pivot Irrigation Systems | UGA Cooperative Extension (C911) is a very good step by step guide to accomplish this process. If you need any further guidance on either of these, or have interest in having an on-farm uniformity test performed, contact your UGA County Extension Agent and they can help get the process started. By following these suggestions, you should have a properly operating pivot ready to go for the upcoming production season.

Once you have the pivot up and running and are confident that it is adequately applying water uniformly with no problems, it is time to start thinking about water requirements for your crops. It's important that you keep an eye on the current weather and soil moisture conditions as you begin planting crops. Cotton typically does not require a lot of water in the first month after planting and in some cases if adequate rainfall is received cotton can go up to squaring and even bloom without additional irrigation applications as exhibited by the red box and water use curve below (Figure 2). However, if it gets hot and dry you may need to apply a few small irrigation applications. The red box below represents the first five weeks of cotton water requirements after planting. Keep a track of rainfall and temperature, your irrigation

efficiency (typically around 65-70% for high pressure systems and 80-90% for low pressure systems), and make irrigation applications accordingly. Keep in mind that the water requirement below is irrigation plus rainfall, and the weekly water requirement recommendation was developed based on a historical average of evapotranspiration. So, your actual water/irrigation requirement may vary slightly based on weather conditions and rainfall during the growing season. For a more in-depth irrigation recommendation it is suggested that you look into implementing either a computer scheduling model either online or via a Smartphone App, or soil moisture sensors. As cotton responds negatively to over-irrigation during critical growth periods usually causing yield reductions and increases in water applied. Even if the yield is not reduced methods such as the Checkbook have shown to have much higher irrigation application amounts with lower irrigation water use efficiency (IWUE) amounts, meaning profit is lost. An example of this is seen from the 2020 growing season in Table 1 below. For more information about either of these contact your local county Extension Agent.

As mentioned earlier, UGA Extension's cotton irrigation guide recommends very little water once the stand is established. Once the planters start rolling, farmers will be focused specifically on planting to try to finish while sufficient moisture is present to ensure a good germination and stand. Once moisture begins to leave the optimum planting level, plan your planting schedule around an irrigation event the day before planting, if available. Keep in mind, you will want to be planting the next day to optimize the moisture. In doing this, careful consideration to the amount of water applied must be determined using such factors as available moisture, soil type and projected weather. There is a fine line between not being able to reap the benefits of irrigation by not applying enough water or having to wait an extra day to dry out, costing time and money.

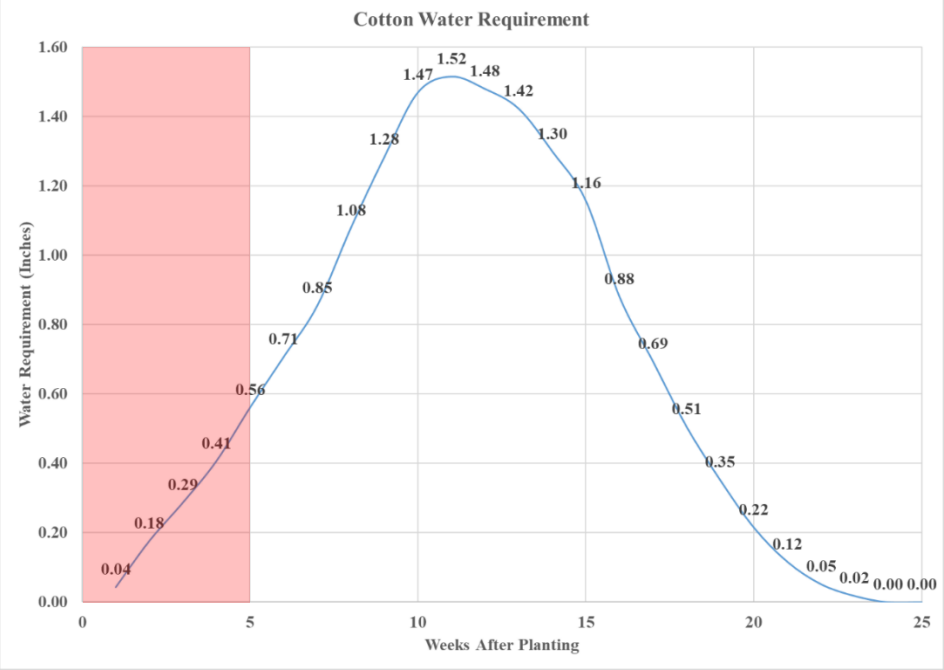


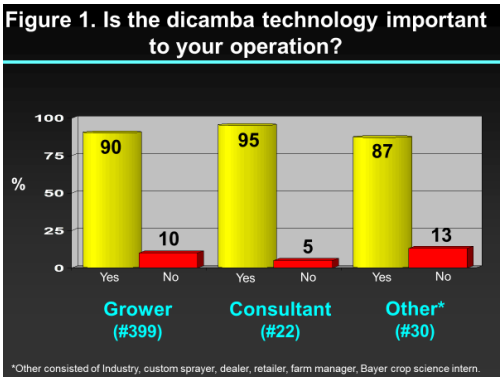
Figure 2. Seasonal Cotton Water Requirement.

UGA Extension has developed a quick and easy irrigation scheduling guide that is laminated and contains the four major row crops grown in Georgia. Attempts to distribute throughout the State are being made at the present. Please check with you local Extension Agent for availability. The guide can also be downloaded at Irrigation Reference Guide for Corn, Cotton, Peanuts, and Soybeans | UGA Cooperative Extension.

Table 1. 2020 Cotton irrigation scheduling data, showing that more advanced methods provide higher yields and IWUE.

Treatment	Irrigation (in)	Total Water (in)	Lint Yield (lb/ac)
Dryland	1.0	22.36	795
45 kPa Sensor	5.5	26.86	1304
20 kPa Sensor	7.75	29.11	1293
75 kPa Sensor	3.25	24.61	1129
Irrigator Pro	5.5	26.86	1245
CropX	4.0	25.36	1113
Valley Scheduler	8.5	29.86	1240
App	6.25	27.61	1270
Checkbook	11.0	32.36	1196

Pesticide Drift Complaints Decline While Dicamba Technology Adoption Has Increased (*Stanley Culpepper*): Adoption of dicamba-tolerant cotton across Georgia has been rapid, with greater than 90% of the seed planted in 2021 containing the trait. This rapid adoption is a response to both improved weed management systems and the ability to keep herbicides on-target.



When surveying 451 individuals (399 farmers) across Georgia, 87 to 95% reported that dicamba technology was important to their farm (Figure 1). Additionally, 57% of the growers noted Palmer amaranth control improved greater than 50% when using the technology; 94% of growers noted at least a 10% improvement in control (Figure 2).

With pesticide stewardship being critically important to the sustainability of humankind, the University of Georgia and the Georgia Department of Agriculture have worked closely with farmers and other pesticide applicators, helping them make wise decisions. This collective effort has led to a 90% reduction in pesticide drift complaints documented by the Cooperative Extension Service from 2015 through 2021. Additionally, there has only been one confirmed dicamba drift complaint from its use in agronomic crops by the Department of Agriculture, since 2017. Many factors have contributed to this success with the collective and cooperative effort of growers, applicators, regulators, Extension agents, consultants, scientists, and local industry partners has been a key element.

Of course, the real question is what happens to the dicamba technology during 2022? That decision is likely to be made in the courts sometime during the year, eliminating our ability to have any influence. Regardless, Georgia's cooperative commitment in stewarding agriculture is an amazing feat that should be briefly celebrated, and then our efforts must expand, as we continue to fight daily to maintain the practical use of all pesticides.

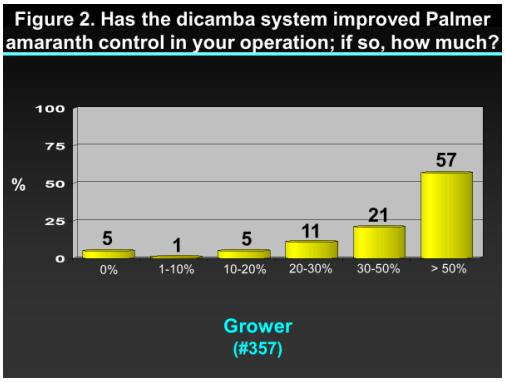


Figure 3. UGA Extension Drift Complaint Survey

Planter Preparation *(Simer Virk and Wes Porter)*: While we still have few more weeks until cotton planting begins across the state, this is a perfect time for growers to start checking their planters and perform any required maintenance for cotton to ensure they are ready for the field. While some of the planters may have already been used to plant corn, it's important to note some significant changes in settings to ensure accurate metering and seed placement for cotton. Planter malfunctions in the field or mistakes at planting can become costly, especially with the input prices this year so it is important to ensure that the planters are dialed in for peak performance. A planter checklist is available here (Planter Checklist (UGA)) for growers to utilize and go thoroughly over the planter to check if any parts need replacement or adjustment before heading to the field. When growers get in the field, it is also important that they get out of the tractor during first few passes and check seed depth and spacing behind the planter to check if everything is setup and functioning properly for the given field conditions. Here are few other key points to consider related to planter setup and performing in-field checks when planting cotton:

1. **Seed depth** – Recommended seed depth for planting cotton is 0.5 to 1.0 inches (if you used the same planter for corn, it is most likely set closer to 1.5 to 2.0 inches deep). Verify seed depth before planting both on a hard surface and in the field. Mechanical seed depth settings can vary among the row-units on the same planter so take the time to check planted seed depth for each row-unit and make necessary adjustments. This is very important especially when planting at shallower depths (0.5 inch)

as even a small deviation from target depth setting on some row-units can result in seeds on top of the ground instead of in the soil with proper seed-to-soil contact.

2. **Downforce** – Proper planter downforce is important to achieve target seeding depth so make sure the downforce system (whether utilizing mechanical or active system) is set to apply adequate downforce on each row-unit. For planting cotton, the required downforce could range anywhere from none (just the weight of the row-unit itself) up to 200 lbs depending on the soil type, moisture and field conditions at planting. Lighter sandy soils and conventional tillage systems will require considerably less downforce than heavy loamy soils and conservation systems. Remember it is common to have variable conditions within a same field, so make sure to adjust settings as field conditions change within the same field or from one field to another if possible.
3. **Seeding Rate** – Recommended seeding rate for cotton is at least 2 seeds per row-foot to attain a plant population of 1.5 to 1.75 plants per row-foot (again here your seed plate and plant population for corn are drastically different so adjust population accordingly for cotton). For growers planting closer to 2 seeds per row-foot, it is critical to avoid any seed metering and placement issues as it may lower the planted population below the minimum recommended seeding rate. For growers without a seed monitor, it is highly recommended to check seed meters on a test stand before planting for verify meter performance, especially singulation. Unnecessary skips or multiples will result in poor or uneven stand establishment which can further impact yield if stand is reduced significantly. Cotton seed being smaller than corn and peanut seed is also very sensitive to vacuum pressure, so make sure to adjust the vacuum appropriately to avoid skips and multiples.
4. **Seed Placement and Seed-to-Soil Contact** – Proper setup and functioning of row-cleaners (when planting in conservation systems), double-disc openers, gauge-wheels, and closing wheels for prevalent field conditions is critical to attain adequate seed placement and proper seed-to-soil contact. Make sure that the double-disc openers are creating a true V-shape furrow, gauge-wheels are running tightly (but not rubbing excessively) against the opening-discs, and closing wheels are aligned perfectly behind the planter and set to apply adequate pressure on the furrow. Check for any signs of improper furrow formation when doing field checks behind the planter and make necessary adjustments. It is important to have both good seed placement and seed-to-soil contact for timely and uniform emergence.

Planting Technology – Issues with planting technology in middle of the planting season can cost significant time and money. Make sure to perform a thorough and timely inspection (at least a week or more) before planting to check status and functioning of all technology components including GPS, seed monitor, wiring harnesses, seed tube sensors, rate control module, electric seed meters, and active downforce system (if available) as well as for any subscription or latest firmware updates for the GPS and the in-cab display. Back up your planting data from the previous year if haven't done so already and make sure the seeding prescriptions are ready to go if utilizing any variable-rate seeding in your operation this year.

Planting Date Selection, Germination and Emergence in Cotton (*John Snider, Gurpreet Virk, Ved Parkash, and Camp Hand*): As the 2022 planting season approaches, growers prepare to plant cotton as soon as the opportunity presents itself. For cotton, planting too early limits seedling emergence and stand establishment due to low temperature during the early part of the season, and excessively late planting can negatively affect lint yield and fiber quality through premature crop termination via exposure to cold, late season temperatures. Therefore, selection of a planting date with acceptable temperature conditions for planting is a critical factor for successful crop production. Recommendations for temperature conditions are as follows: a four inch soil temperature greater than or equal to 65 °F in the first two to three days after planting and a favorable five-day temperature forecast. Under favorable conditions, germination and seedling emergence takes 4 to 9 days after planting or after approximately 50 to 60 heat units (DD60s) have accumulated. Numerous studies have demonstrated no significant differences in final lint yield when cotton was planted between April 1 and May 25. However, for South Georgia, planting between late April and early May is considered a safer early-season planting window depending on prevailing environmental conditions (Hand et al., 2022). Another valuable resource available to growers throughout the US cotton belt is the Cotton Planting Conditions Calculator developed by North Carolina State University (http://climate.ncsu.edu/cotton_planting). This tool presents the five-day temperature forecast (DD60 forecast) information into 6 nominal planting condition categories ranging from Poor to Excellent and is a user-friendly resource for cotton growers.

Having a general understanding of the physiological processes occurring during the germination and emergence phase of crop development helps growers better understand and prepare for some of the common challenges faced during planting season. Immediately after planting, within 4-6 hours, seeds begin to take up water during a process known as imbibition. Thereafter, a number of physiological process are activated and metabolic activity increases along with respiration rates and mobilization of energy reserves (oil and protein), which collectively drive embryo growth. Within one or two days after planting, depending on temperature, the radicle (Image 1A) emerges out of the seed coat. This represents the end of the germination process, and the cotton plant has now entered the seedling stage. The primary root grows downward into the soil profile and the region just below the cotyledons (the hypocotyl) takes on a hook-like appearance and extends upward, pulling the cotyledons up through the soil. Emergence is complete when the cotyledons have been pulled above the soil surface (Image 1B).

Within the context of these developmental milestones, the requirements for seed germination and emergence can be readily understood. For example, cotton seeds should be placed 0.5 to 1 inch deep in good contact with moist, yet well aerated soil. These conditions ensure that there is sufficient moisture available for imbibition and adequate oxygen available for aerobic respiration, which is necessary to fuel early season growth. Stand responses to waterlogging, soil crusting, soil compaction, and seed depth are also linked to plant developmental processes. As mentioned previously, adequate oxygen supply is required to drive plant growth, water logging conditions deprive the growing embryo of oxygen, resulting in death of the young seedling. Soil crusting mechanically impedes emergence, and in some instances, the hypocotyl will snap as it attempts to pull the cotyledons through the crust (Image 1C). Soil crusting issues can be resolved by running a rotary hoe over the field to facilitate emergence. At the opposite extreme, poor seed-to-soil contact and a lack of mechanical pressure against the seed and developing seedling may

not provide enough resistance to remove the seed coat as the seedling moves through the soil profile. As a result, the seed coat may prevent the unfolding of the cotyledons. Regarding seed depth, seeds planted shallower than those noted above will be more prone to drying out following germination, whereas seeds planted too deep may utilize their energy reserves prior to emergence, limiting stand establishment. Growers should target a final plant stand of at least 1.5 plants per row ft. and should adjust seeding rates based on the germinability of their particular seed lot. Planter settings to optimize seed depth and seed-soil contact are discussed elsewhere in this newsletter.

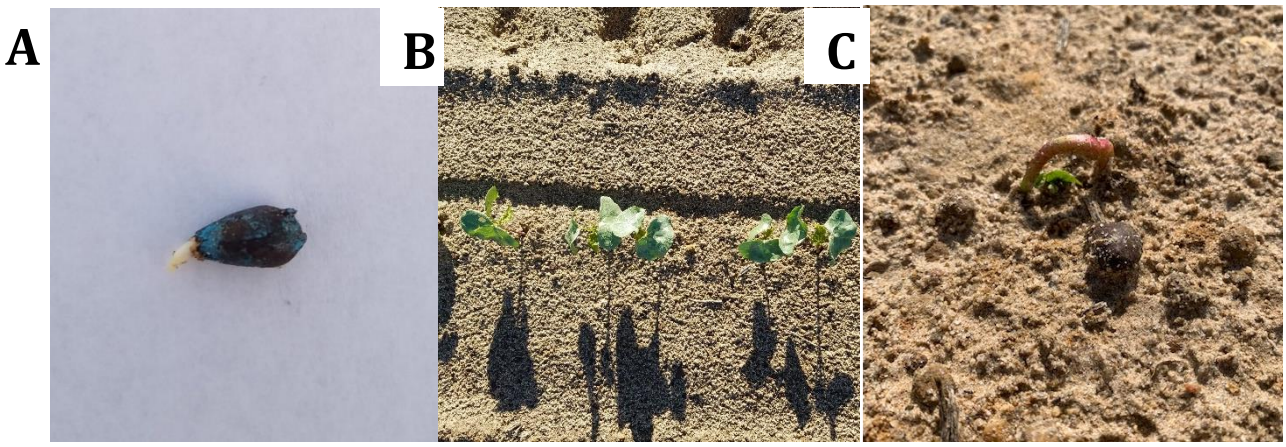


Image 1: The first visible structure out of the seed (radicle; A), emerged cotton seedlings (B), and soil crusting impeding emergence (C).

References

Hand, LC, Culpepper, S, Harris, G, Kemerait, B, Liu, Y, Perry, C, Hall, D, Porter, W, Roberts, P, Smith, A, Virk, S, Bag, S, Sintim, H. 2022. 2022 Georgia Cotton Production Guide. University of Georgia Extension. Annual Publication 124-2.

Control The Things You Can Control – Seeding Rates (*Camp Hand*): This past spring was my first on the road doing the county production meeting circuit, and it was a busy one. From mid-January to March 10 myself, representatives from the Cotton Commission, and members of the UGA Cotton Team did 49 meetings. In-person meetings are key to the success of the county delivery system, and sticking to the county delivery system is what has set UGA Extension as one of the best extension systems in the country. It was great to get back in person, and for me to be able to meet people as I enter my second year on the job.

One thing I talked about at every meeting was some of the wide-row research I did last year. The main goal (for most folks) in adopting this system is the potential for reducing input costs – namely seed costs. In our study here in Tifton, we reduced our seed cost 40 and 50% when we went from 36-inch rows to our wider 60- or 72-inch rows, respectively. We also saw yield reductions of 200 to 500 lbs. of lint per acre when we went to wider row spacings. So my message this winter was that I'm not sure there's a fit in

Georgia for this system on a lot of acres. After I got done talking about this, the follow up question was inevitably, “Well what if we keep the same row spacing but reduce our seeding rates?” Fantastic question.

One of my good friends likes to remind me, “Anybody can plant cotton, but can’t everybody get a stand.” This is a complex conversation, and lots of factors go into getting a stand. The first and likely most important factor is the environmental conditions at and after planting. We have got to have ideal temperatures and moisture to ensure the seed we put in the ground germinates and emerges. A fantastic resource to assist in the planting decision is the Planting Conditions Calculator, provided online by NC State at this link: https://products.climate.ncsu.edu/ag/cotton-planting/. You can select an area near your farm and this tool will use the 7-day weather forecast to determine the planting conditions based on degree day accumulation and rainfall. Luckily, we have a wider planting window than many of our friends in other cotton producing areas. In some places, the planting window is realistically 10 days, while here we could start in April and plant into June. Hopefully at some point during our wider planting window, mother nature will cooperate!

Another consideration is the quality of the seed you put in the ground. The predominant way to predict seed quality is warm and cool germ. Warm germ is provided on the bag of seed, and cool germ is easily obtainable from the seed company or dealer. You could also get your seed tested through a service provided by the Department of Agriculture.

The frustrating part about the aforementioned factors associated with stand establishment is that they are largely out of our control. Of course we can’t control mother nature, but seed quality is largely determined prior to getting on the farm. Recent research has demonstrated that leaving seed in the sun for 6 hours or dropping it multiple times from seven feet high didn’t impact stand establishment or vigor. So, even being relatively harsh with the seed didn’t affect stand establishment. So why talk about the things we can’t control?

A sort of mantra for me lately has been “Control the things you can control”. So I like to talk about the things that we can’t control to reiterate that so many things can go wrong, let’s make sure the things we can control go right. First thing’s first: make sure your planter is dialed in and ready to go when you pull in the field. Our precision ag specialists, Drs. Wes Porter and Simer Virk developed a planter checklist to help with this and it can be found earlier in this newsletter.

The next thing you can control – and what I have been asked about most this year – is seeding rate. I have heard a lot of talk about reducing seeding rates this year, and some of that might be justified, but I have a few thoughts on this before we all start jumping on seeding rates of 20 thousand per acre.

The first thought is not every seed you put in the ground will emerge and contribute significantly to yield. Many of you reading this probably just said to yourself, “Duh!”, but I like to keep it simple. Keep in mind that generally, the past two seasons have been pretty good to us in terms of planting conditions. Nothing too crazy, and I didn’t hear a ton about replants due to inadequate initial stands (not talking about deer damage). I’ve gotten to help out with some seeding rate trials in a couple of counties (two studies in Colquitt County with Jeremy Kichler and three studies in Bleckley County with Cole Moon) throughout

the state, looking at seeding rates as low as 20 thousand per acre and as high as 45 thousand per acre. In three of those studies emergence was over 80%, and in all five locations emergence was over 70%. Overall, I would say that is pretty good. However, if you plant 20,000 seed per acre and only get 70% emergence/establishment, historically that is teetering on the edge of needing to replant (depending on the uniformity of the stand). The interesting data is what was seen on the return on investment once yield and quality were accounted for. The highest return on investment occurred when a seeding rate of 30,000 per acre was utilized (roughly 2 seed/ft). Averaged across the locations with more ideal stand establishment conditions, this resulted in a final plant stand of 1.7 plants per foot. In less ideal conditions the final plant stand was slightly less, 1.5 plants per foot. Historically, we know that maximum yields are attainable at a final stand of 1 plant per foot, **but the key is that stand has to be uniform!!!** We need to avoid large skips/gaps in stand. Uniformity is a large part of this conversation that is often left out.

The second thought I have is about this year specifically. Inputs are high and it is something at the forefront of everyone's minds and a major part of the decisions that are being made for this season. Many people are probably thinking about reducing seeding rates to help save on these outrageous input costs. The question I will pose to you is this: **How much would it cost you to replant if you reduce your seeding rate and end up with a stand failure?** As mentioned earlier, a lot of things can go wrong when getting a stand. The weather might not cooperate, this might be the year you get "bad seed", or any other number of factors. Is this the year to find all that out? Probably not on a large basis. **Control the things you can control.** Put enough seed in the ground that you will be comfortable getting a stand the first go round (if everything goes right). The last thing you want to do is make an extra trip over the field that could've been prevented from the outset. If you don't get a good stand, all the other inputs (fertilizer, herbicides, etc.) aren't being used to their fullest potential and you might not be getting the best return on your investment. The first step to be successful in making cotton and covering costs this year is to get a stand. Everybody can plant cotton, but can't everybody get a stand. I hope everyone reading this gets a stand. If y'all have questions please don't hesitate to reach out to your local UGA County Extension Agent. We are all here to help!

Make Good Management Decisions or PPO Resistance in Palmer amaranth Could Spread Rapidly! (*Stanley Culpepper and Taylor Randell*): Over the past few years, our research has shown that a Palmer amaranth population collected in Georgia cannot be controlled with topical applications of PPO herbicides, such as Reflex, Cobra, and Blazer (Figures 1-3).

In 2022, research also confirmed this Georgia population of Palmer amaranth cannot be controlled with the residual activity of Reflex or Valor (Figure 4). The level of resistance is expected to exceed 15X for both of these herbicides.
Although herbicide shortages and price increases are challenging a farmer's sanity this year (more than normal), we must continue to make intelligent decisions while managing the most problematic weedy pest in the history of Georgia agriculture. Research conducted for well over a decade continues to suggest that the basic concepts of a sound diversified cotton weed management program are essential for long-term sustainability.

Figure 4. Palmer Response to Valor PRE.

1. Use tillage or cover crops to reduce weed exposure to herbicides (selection pressure).
2. No Palmer amaranth emerged at planting (cover crops, tillage, burndown).
3. Two residual herbicides both effective on Palmer amaranth applied at planting.
4. Timely POST herbicide tank mix applications….sequential applications!.
5. Layby directed or hooded application to finish out the crop.
6. Remove escapes before seed production.

Silverleaf Whitefly Update (*Phillip Roberts*): Silverleaf whitefly (SLWF) is a sporadic and often localized insect pest of cotton in Georgia. Infestations are most common in areas where both cotton and vegetable production occur. More detailed information on SLWF biology and ecology in Georgia and area-wide management can be found in the publication "*Cross-Commodity Management of Silverleaf Whitefly in Georgia*" (https://secure.caes.uga.edu/extension/publications/files/pdf/C%201141_1.PDF).

There are several risk factors influencing SLWF populations during the year. One important factor is winter weather. SLWF survive the winter months on both cultivated and wild host plants. Mild winters favor survival of SLWF. Although temperatures are rarely low enough in South Georgia to kill SLWF outright, freezing temperatures which kill host plants infested with immature SLWF effectively kills immature SLWF on those plants.

Table 1. Cumulative 11.1°C degree days (SLWF Degree Days) and days below 32°F in Tifton Georgia from November 1 thru March 31 for crop years 2004-2021 and percent SLWF infested and treated acres in Georgia cotton. Years above the 2004-2021 mean for Cumulative 11.1°C DDs and years below the mean days below 32°F are highlighted in yellow.

Crop Year	Cumulative 11.1°C DDs (Nov 1-Mar 31)	Days<32°F (Nov 1-Mar 31)	% SLWF Infested Acres	% SLWF Treated Acres
2004-2021 mean	*476*	*17*	*15*	*7*
2004	421	20	1	0
2005	469	17	2	0
2006	453	24	2	0
2007	509	13	10	4
2008	430	14	5	1
2009	446	22	5	1
2010	251	26	4	0
2011	403	32	2	1
2012	630	11	20	10
2013	377	13	12	7
2014	380	21	10	1
2015	352	14	0	0
2016	616	16	20	9
2017	676	6	85	70
2018	526	20	20	2
2019	496	8	30	6
2020	589	6	40	22
2021	546	16	7	0.5
2022	562	9	?	?

Cold temperatures slow development and population buildup of SLWF. We can calculate SLWF degree days in a similar fashion as we calculate DD60s to estimate cotton growth and development. For SLWF we use a minimum temperature of 11.1°C or 52°F. SLWF complete a generation in 312 11.1°C DDs. SLWF populations grow exponentially with each generation, in general the more generations the more SLWF. I have received several questions regarding SLWF for the 2022 cotton crop. Many factors between now and harvest can influence SLWF infestations. For example, hot and dry conditions favor SLWF reproduction and survival. Very frequent rainfall during the summer of 2021 was not conducive for SLWF reproduction and survival. So where are we today in terms of weather compared with previous years.

SLWF and Weather: Since November 1, 2021, we have accumulated 562 SLWF DDs which is above the 2004-2021 average of 476 SLWF DDs (Table 1). It should be noted that the four crop years (2012, 2016, 2017, and 2020) with the highest accumulated SLWF DDs are the same four years with the highest percent of SLWF treated acres. Number of days below freezing since November 1, 2021 is 9 which is below the average of 17. This is just weather data but it does indicate that **winter and early spring temperatures were above average and suggest that our risk for SLWF in 2022 is elevated**.

SLWF Traps: We have been monitoring yellow sticky traps for SLWF at 20 locations since January 1, 2022. To date in 2022, SLWF captures have averaged 1.85 per location per week compared with 0.48 SLWF during the same time period in 2021. Interestingly, mean trap captures have ranged from 0.08 to 9.32. So SLWF have been captured at all locations and captures are consistently higher in some locations likely due to a source of SLWF (i.e. SLWF reproductive host plants). We will continue to monitor traps each week and post periodically on ugacotton.com.

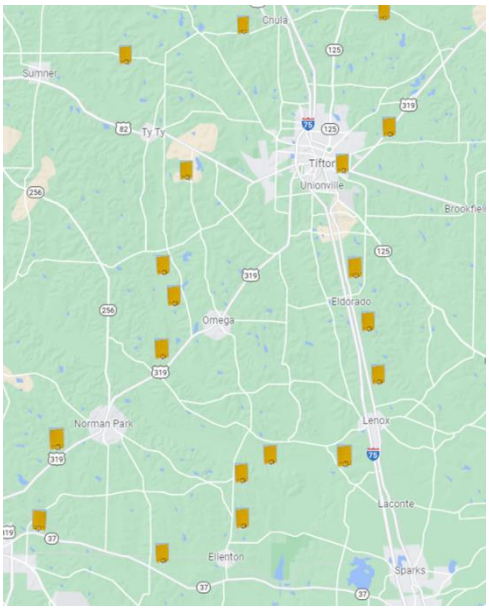


Figure 1. Silverleaf whitefly trapping locations.

SLWF Observations: Reports from county agents and consultants are that SLWF populations are low in vegetable crops at this time. As I mentioned earlier, a lot can happen in the coming weeks in terms of SLWF infestations in cotton.

Weather conditions during Spring and summer will be the primary factor affecting SLWF populations from this point forward. Hot and dry conditions will favor SLWF population buildup. If you are in an area prone to have SLWF, NOW is the time to manage risk factors we can control (Figure 2).

As we prepare to plant, attempts should be made to minimize overall risk of SLWF. Decisions now could greatly influence SLWF infestations later in the summer.

1. Location: Crops produced in a given area can be viewed as sources and sinks for SLWF populations. Spring vegetable and melon crops are a source of SLWF infesting cotton. In the fall cotton is a source of SLWF infesting fall vegetables. The nearness of cotton to a SLWF infested field increases the risk of SLWF. Minimize planting cotton next to SLWF infested crops. If planting cotton near SLWF infested crops, be sure to avoid late planting and use a smooth leaf variety. Destroy SLWF host crops immediately after harvest; this includes vegetable and melon crops in the spring and cotton (timely defoliation and harvest) and other crops in the fall. Historically SLWF infestations are greatest in areas which produce both vegetables and cotton. Several vegetable crops and melons may be a potential source of SLWF. In all crops, including cotton, fields should be immediately destroyed to eliminate potential SLWF reproduction.

2. Planting Date: the risk of SLWF problems increases as planting dates are delayed. SLWF complete a generation in about 2 weeks during summer months and populations can increase rapidly. The impact of SLWF on yield is dependent on the growth stage of cotton when SLWF infest the crop. Potential yield loss is greater when infestations appear during squaring or early bloom compared with late bloom. The duration or time of control required to protect yield and quality from SLWF is also dependent upon planting date. April and early May planted cotton is at lower risk for SLWF problems compared with late May and June planted cotton. Bottom line is to avoid late planting.

3. Variety Selection: SLWF prefer hairy cotton compared with smooth cottons. There is a direct correlation of SLWF infestations in cotton based on the degree of leaf hairiness. Avoid hairy cottons especially if planting near a source of SLWF or if planting late.

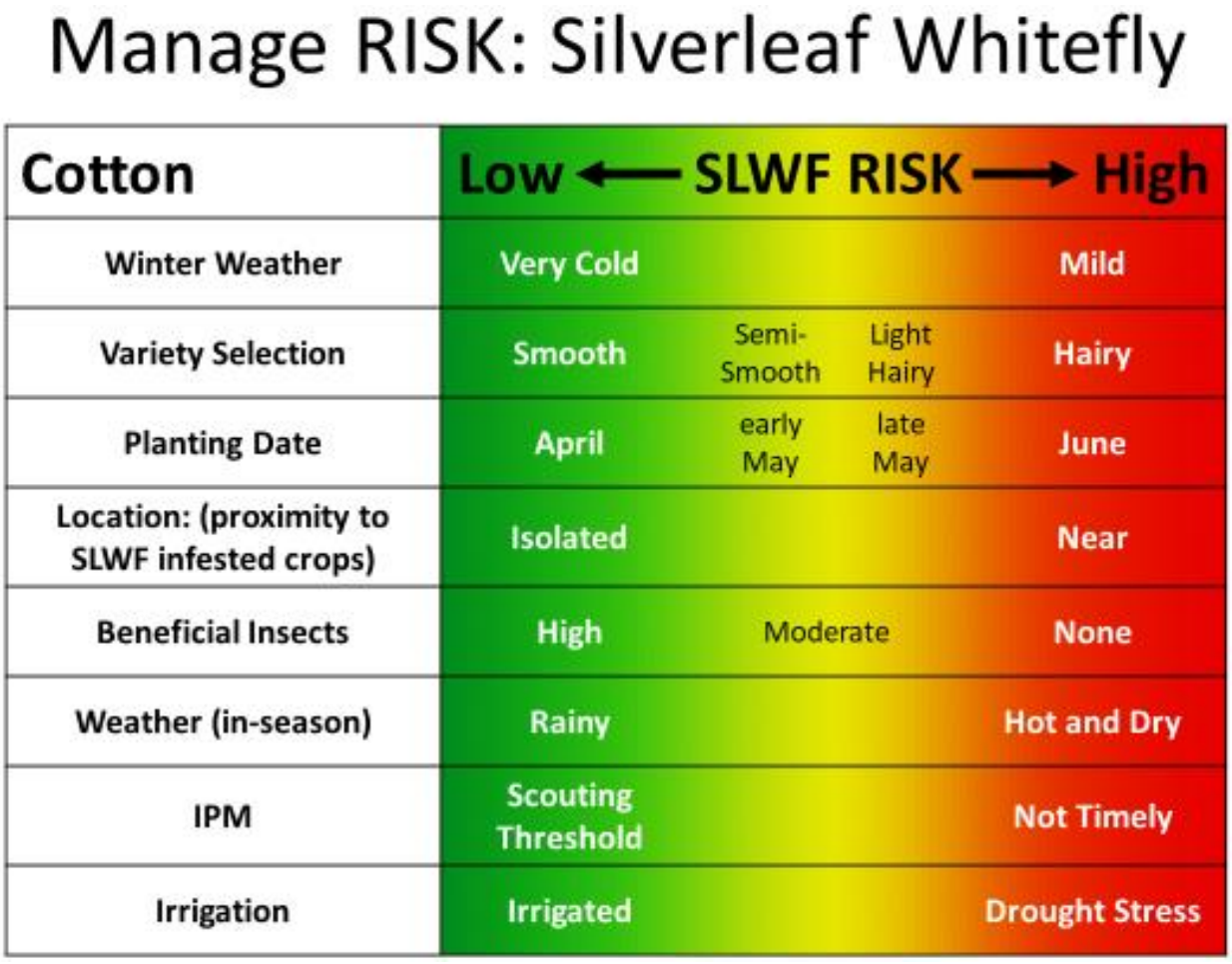


Figure 2. Silverleaf whitefly risk factors in cotton.

Important Dates:

Southeast Research and Education Center Field Day – Midville, GA – August 10, 2022
Cotton and Peanut Research Field Day – Tifton, GA – September 7, 2022