UNIVERSITY OF GEORGIA EXTENSION

UGA Cotton Team Newsletter
April 2025

Articles in this month's issue include:

1. It's time to think about terminating cover crops (*Taylor Singleton*)
2. Thrips require the use of a preventive treatment (*Phillip Roberts*)
3. Last tips for variety selection (*Camp Hand*)
4. A pre-season checklist for diseases and nematodes of cotton (*Bob Kemerait*)
5. Maximize cotton emergence by ensuring your planter is ready (*Wes Porter*)
6. Seed and seedling vigor (*John Snider and Camp Hand*)
7. Deciding on an ideal seeding rate (*Wade Parker*)
8. At-plant residual herbicides remain essential for success (*Stanley Culpepper and Jenna Vance*)
9. Irrigation system prep and early season water requirements for cotton production (*Wes Porter, David Hall, Jason Mallard, Phillip Edwards, and Daniel Lyon*)
10. A few tips to reduce residual herbicide injury (*Stanley Culpepper and Jenna Vance*)

It's time to think about terminating cover crops (*Taylor Singleton*): With warmer temperatures forecasted to arrive Easter weekend, I'm sure many folks are itching to get the planters rolling! For those of you that plant cover crops, if you haven't already terminated them, its time to put together a plan.

I have zero doubts that if you grow cover crops and plant into them every year, you know exactly what works best for your operation regarding termination timing prior to planting. If you're a new(er) cover crop adopter, it's important to understand that having a termination plan for cover crops is critical to ensuring there is no interference with the planting or managing of cotton. While increasing biomass often increases benefits associated with cover crops, we have to make sure we are ready to manage the cover accordingly.

Technically speaking, there are three different types of cover crop termination prior to planting any cash crop: 1) winter kill (…this isn't really an option for us in the relatively "mild winter" cotton producing regions of Georgia), 2) **mechanical termination**, and 3) **herbicide termination**.

Mechanical termination involves using some sort of tillage to incorporate any cover crop plant material that has accumulated, or rolling the cover with or without crimping (more on this later). Once the residue is incorporated with tillage, it then will begin to breakdown. If there is a lot of residue, however, multiple passes may be necessary to prepare a seedbed suitable for most planting equipment capabilities. When tilling in cover crop, you must consider that weed suppression and soil management benefits will be less than when the cover remains on the soil surface. Mowing can technically terminate cover crop once they have entered into a reproductive stage, however the residue will need to be incorporated with some sort of tillage.

Rolling (with or without crimping), especially when paired with an herbicide termination, is a great way to flatten cover crops to form a mulch layer. Studies have found that when the plant is still rooted in the ground, with the residue rolled in the same direction, that it is easier to move equipment through the field vs mowed residue on the soil surface that can wrap up around the planter.
Herbicide termination is the most effective way to terminate cover crops. For successful termination, you must use the proper herbicide for the situation… paying attention to the relationship between cover crop species, growth stage, the weather, and application rates. Broad-spectrum herbicides are the most common products used in small grain cover crop termination, however additional products can be added in to control broadleaf/legume species along with emerged weeds – check out the Cotton Production guide and get in touch with your county agent for more information on herbicide specifics for your situation.

However you decide to terminate your cover crop prior to cotton planting, there are some really important considerations to keep in mind.

1. *Mixtures of different cover crop species are more complex* – especially if the species included in the mix are at different growth stages/levels of maturity. A more complex herbicide tank-mix and considerations on timing for that application may be needed to kill cover crop mixtures and ensure no impacts to young cotton.
2. *Cover crop termination must be timed for optimum growth* – shooting for high levels of biomass at planting (think weed suppression and soil health benefits), but not more than equipment can handle and/or you're comfortable with.
3. *Terminate well in advance of planting cotton* – make sure and terminate all cover crops 2 to 3 weeks ahead of your target planting date to minimize negative impacts of a decomposing residue on seeding cotton emergence. Additionally, this will help ensure an actively growing cover hasn't depleted the soil moisture when it's time to plant cotton.
4. *Be mindful of early season pests* – If green vegetation is present at cotton planting, there is an increased risk of early season insect pests, especially if legumes are present. Minimize these risks by ensuring the cover crop is completely terminated at least 2 weeks (3 is better in this situation) prior to planting.

Thrips require the use of a preventive treatment (*Phillip Roberts*): Thrips are an extremely consistent insect pest of cotton in Georgia and the Southeast. Thrips infest all cotton planted in Georgia at emergence and are a potential pest until cotton reaches the 4-leaf stage and seedlings are growing rapidly. Thrips initially feed on the cotyledons and then feed primarily in the terminal on unfurled leaves once available. Excessive thrips feeding results in crinkled true leaves and stunting of plants resulting in reduced yield potential. Thrips are the only insect pest of cotton that UGA recommends a preventive treatment at planting. Small plot research trials and large plot on-farm demos consistently show a yield response to preventive treatments for thrips control.

Preventive insecticide treatments include seed treatments (primarily imidacloprid), infurrow liquid applications of imidacloprid or acephate, and aldicarb applied as an infurrow granule. Infurrow treatments are more active and have longer residual compared with seed treatments. Supplemental foliar sprays for thrips may be needed, especially following seed treatments, if thrips infestations are high. Foliar sprays should be applied if thrips exceed 2-3 thrips per plant and immatures are present. The presence of immature thrips suggest the at plant systemic insecticide is no longer providing control. Seedlings are most susceptible to thrips during early growth stages (1-2 leaf cotton is at greater risk than 3-4 leaf cotton. Seedlings which are growing slowly due to cool temperatures or other plant stresses are also at greater risk to thrips injury.

ThryvOn cottons provide very good protection from thrips. We have evaluated ThryvOn for several years and never observed a planting which would have benefitted from a supplemental foliar treatment. ThryvOn does not provide high levels of thrips mortality, we have observed thrips infestations which clearly exceed our threshold for non-ThryvOn cottons. However, thrips injury has always remained very low. For this reason, it is important that we DO NOT make decisions to treat ThryvOn for thrips based on insect counts. The threshold for thrips on ThryvOn cotton is treat if excessive plant injury is present and immature thrips are present.

Last tips for variety selection (*Camp Hand*): Many growers have already made their variety selection decisions for 2025, but there are still some that have not and I had an interesting conversation with a grower recently that brought a unique perspective that many others may be considering in 2025.

Of course if you came to production meetings you likely heard me talk a good bit about varieties, but if you want a refresher you can find the results here. There were a lot of things influencing these results in 2024, but in large part the all varieties performed well, with 7 standing out among the rest (DP 2038 B3XF, DP 2127 B3XF, DP 2333 B3XF, ST 6000 AXTP, NG 5430 B3XF, DG 3799 B3XF, and AR 9831 B3XF). In lower yield environments, 5 of those 7 did very well, and similar trends were observed in above average yield environments. It did look like DP 2038 B3XF performed better in below average yield environments, while ST 6000 AXTP rose to the top in above average yield environments. All things to take into consideration for certain.

Another thing I talked about a good bit were the bronze wilt like symptoms observed in Georgia in 2024. Five varieties were identified that are more likely to display those symptoms than others – this has been discussed at every production meeting, and it is also in the 2025 Cotton Production Guide – but if you would like more info contact your county agent. Best way to avoid the symptoms is not to plant one of those five varieties.

But the unique perspective I discussed earlier from a grower conversation just a couple of days ago is something I believe needs to be discussed. We all know the situation going into 2025, and everyone is going to do everything they can to make this thing work this year. In this newsletter is a lot of good info

on protecting your crop from early season pests, reducing seeding rates, and maximizing other inputs. But I know that the thing on growers' minds is what are we going to cut. I was talking with a grower the other day about varieties and mentioned a couple – he asked, "Well what about *insert name here* variety?" I responded that is was in the top yielding group for our variety trial but wasn't quite as aggressive as some other varieties most growers have prior experience with, with respect to PGR management. We then entered a conversation on how to manage this particular newer variety, and he said, "I probably will plant that variety because it may save me a trip across the field spraying PGR." And while mepiquat chloride is not at all expensive, diesel fuel is, and thus cutting a trip across the field can certainly save some money. So, below is my relative gauge of variety responsiveness to PGRs – the top group are most aggressive and require more intensive PGR management while the bottom group are the most responsive to PGRs and may only require one or two applications.

PGR Responsiveness of Varieties

Responsiveness to PGRs	Variety
Least Responsive (i.e. Highest growth potential)	DG 3615 B3XF, DG 3799 B3XF, DG H959 B3XF, DG 4484 B3TXF DP 2055 B3XF NG 5430 B3XF
Varieties with similar growth potential as first group, but slightly more responsive to PGRs	DP 1646 B2XF, DP 2012 B3XF, DP 2038 B3XF, DP 2127 B3XF, DP 2131 B3TXF, DP 2141 B3XF, DP 2211 B3TXF, DP 2328 B3TXF, DP 2349 B3XF PHY 475 W3FE, PHY 545 W3FE ST 5091 B3XF, ST 6000 AXTP NG 4190 B3XF AR 9371 B3XF, AR 9831 B3XF
Varieties that may need PGRs, but pre-bloom applications not typically necessary	ST 4595 B3XF, ST 4990 B3XF DG 3528 B3XF NG 3195 B3XF, NG 4936 B3XF, NG 3299 B3XF DP 2020 B3XF, DP 2239 B3XF, DP 2333 B3XF, DP 2317 B3TXF PHY 411 W3FE, PHY 415 W3FE
Most Responsive (i.e. Lowest growth potential)	PHY 360 W3FE, PHY 400 W3FE DP 2115 B3XF

Why is PGR management being discussed in April? Because if you want to try and save a trip across the field in July, you need to decide the variety you are going to plant now. But if you decide to go this route, make sure and plant a variety that still has good yield potential and fits other criteria on your farm as well. Regardless of what cotton is selling for right now, we still have to make the crop. Consult the on-farm variety trial results linked previously, Statewide OVT results, the table above, and your local UGA County Extension Agent when making these decisions. As always, if you need anything don't hesitate to reach out.

A pre-season checklist for diseases and nematodes of cotton (*Bob Kemerait*): The 2025 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. If this message seems familiar to you, it is because it is something I have repeated many times. Though you may grow tired, the message remains as important now as it ever was.

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), Velum (6.5-6.8 fl oz/A), AVERLAND FC (3.5

fl oz/A) and OUTREACH, 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.

Maximize cotton emergence by ensuring your planter is ready (*Wes Porter*): Corn has been or is being planted currently and next it will be time to transition into planting cotton and peanut. While we still have a few more weeks until cotton planting begins across the state, this is a perfect time for growers to start checking their planters and performing any required maintenance to ensure they are ready for planting cotton. This season is going to be tough on cotton with input prices on the continual rise and cotton prices very low. We cannot afford to mess up with anything during the season, and especially not with planting and stand establishment.

In some cases, planters have already been used and have planted corn, it's important to note some **significant changes** in planter settings are required to ensure accurate metering and seed placement for cotton when moving from another crop. Planter malfunctions in the field or mistakes at planting are common and can become costly, especially with the high seed prices. Therefore, it is important to ensure that the planters are dialed in for peak performance in the field. A planter checklist is available here: https://extension.uga.edu/publications/detail.html?number=C1231&title=row-crop-planter-checklist-tips-to-achieve-successful-stand-establishment

I encourage Extension Agents and growers to utilize this checklist and go thoroughly over different planter components to check if any parts need replacement or adjustment to get it field ready. Once out in the field, it is important that the operator gets out of the tractor during the first few passes and carefully check seed depth and spacing **across all rows** behind the planter. This is also the best time to check if the planter is setup and functioning properly for the given field conditions such as soil moisture, residue, etc. Here are a few other key points to consider related to planter setup and performing in-field checks when planting cotton:

1. **Seed depth** – The recommended seed depth for planting cotton is 0.5 to 1.0 inches and if the same planter has been used for planting 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 (T-bar handle adjustments) 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 accordingly. This is very important especially when planting cotton at shallower depths (≤0.5 inch) as even a small deviation from target depth setting on some row-units can result in seeds being placed on top of the ground instead of in the soil and 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, pneumatic, or an active hydraulic 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 lbf 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 (strip-till or no-till). Higher moisture content will require lower downforce to prevent compaction. Remember it is common to have variable conditions within the same field, so make sure to adjust settings accordingly as field conditions change within the same field or when moving from one field to another.
3. **Seeding Rate** – The 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 the seed plate and plant population for corn are drastically different so adjust the population accordingly for cotton). As dumb as this sounds, check the seed plate and ensure you have switched the plate and any other internal components to cotton. For growers planting less than 2 seeds per row-foot, it is critical to avoid any seed metering and placement issues as it may result in inadequate stand establishment with a potential for yield loss. For growers who are not utilizing a seed monitor during planting, it is highly recommended to check all seed meters on a test stand before planting to verify meter performance, especially singulation. Growers should check the availability of seed meter test stand with their nearest dealership as most equipment dealers have these available today and offer seed meter testing as a service. Seed meter testing is important as any unnecessary skips or multiples during planting will result in poor or uneven stand establishment which can further impact yield if the 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** – First check seed tubes to ensure they are free of debris and the seed has a clear path. 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 for attaining 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 to properly close 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.

5. **Planting Technology** – Several planting technologies are available today on modern planters to improve seeding performance. Ensure 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 before you begin planting this year and make sure the seeding prescriptions are ready to go if utilizing any variable-rate seeding in your operation this year. Issues with planting technology in the middle of the planting season can cost significant time and money so make sure to address any issues before heading out to the field.
6. **Variability During Planting** – As mentioned above both variable field and environmental conditions are unavoidable during planting, thus, it is critical that growers evaluate their planting conditions day to day, field to field, and especially if there are significant weather events (such as temperature changes or rainfall) during the planting window. These are common and will require **adjustment to planter settings based on the existing in-field conditions**, with special consideration to variability in soil texture, moisture, and/or crop residue. Most growers usually plant two to three varieties on their farm so any change in cotton varieties, specifically in seed size, would also require adjustments to seed meter settings and vacuum to ensure good seed singulation with minimal skips or doubles.

Remember you only get one chance to place the seed and close that furrow properly so consistent and regular checks during planting are important to ensure that the planter is operating at peak performance in each field and throughout the whole planting window.

Seed and seedling vigor (*John Snider and Camp Hand*): Since planting is right around the corner for many growers, it's as good a time as any to talk about vigor within the context of seeds and seedlings. However, when we discuss vigor, I think it is important to distinguish between two different types of vigor that we often hear about.

What are seed and seedling vigor?

First, there is seed vigor, which is the ability of seed to germinate and emerge rapidly and uniformly under a broad range of environmental conditions (Pilon et al., 2016; Bourland, 2019). While there is no single measure that can be used to predict how seedlings will emerge across a broad range of environmental conditions, germination tests are the most commonly utilized assessments. The warm germination test (estimated under maximum incubation temperatures of 86 °F) is a measure of seed viability and answers the question "What percentage of seed will germinate if placed into ideal conditions for germination?" Since the warm germination test does not address emergence under undesirable

conditions, another test is included to estimate seed vigor. This is the cool test (or vigor test), and it is conducted at 64.4 °F to estimate the vigor of a given seed lot when placed into less than ideal conditions. In general, cool tests can be used to compare relative differences in seed vigor across different seed lots. The cool test answers the question "Will this seed lot be more likely to germinate under suboptimal conditions than another seed lot?" Cotton seed companies have internal minimum standards for warm and cool germination tests (Bayer Crop Science, 2023), and if growers are interested in obtaining the test results for a given seed lot, they are encouraged to contact their retailer or seed company representative to obtain this information.

It is extremely important to understand that a specific warm or cool germination percentage does not necessarily predict actual field emergence (i.e. 80% cool germination does not guarantee 80% emergence under cool temperatures in the field). Therefore, the numbers provided should be seen as a way to possibly understand relative differences between seed lots in their viability (warm germination test) and/or seed vigor (cool test). For example, one of the first experimental data sets I received after I moved to Georgia in 2012 evaluated stand establishment and seedling growth for 11 different cultivars in on-farm trials conducted at five locations across Georgia (Snider et al., 2014). Despite all seed lots having high warm (93 to 96%) and cool (72 to 92%) germination values, there were significant differences in emergence. Cultivar differences in emergence were not associated with differences in seed germination test results, and all seed lots would have been considered high quality lots. However, emergence was strongly associated with cultivar differences in seed size and the amount of oil that was present in the cotton seed at planting. What this means, in this instance, is that seed traits other than germination could be influential in determining stand establishment. Cotton specialists across the US cotton belt have been actively researching which seed trait or combination of traits can be used to better predict seed and seedling (discussed next) performance in the field.

Seedling vigor is also difficult to define, and no single measurement can tell a grower if a seedling will survive once it has emerged or how vigorously it will grow after emergence. In general, when seedling vigor is measured, some measure of individual plant growth is used (shoot fresh weight, shoot dry weight, leaf area, root growth traits, etc.). Bourland (2019) identified three key traits that he considered essential components of seedling vigor: well-developed seedling roots, rapid true leaf differentiation, and low incidence of seedling disease. Essentially, a cotton seedling that exhibits rapid above-ground growth and below-ground growth along with a reduced risk of succumbing to disease (greater survival) would have high seedling vigor. We have shown that larger-seeded cotton cultivars with high energy reserves in the embryonic seedling tend to have more vigorous above and below-ground growth, especially when planted into suboptimal conditions. Past collaborative work between the cotton physiology lab and Dr. Porter's team has even indicated that variety selection can affect early seedling growth responses to planter settings like depth and downforce. This should not be surprising as larger seeded cultivars tend to have greater energy reserves than smaller seeded cultivars.

What can be done?

As you read through the sections above, my guess is that you're thinking something along the following lines. "It's all good and well to know what seed traits affect vigor, but how does this really help the grower?" Some of you may use more colorful language, and that's ok too. This is a fair question because

my guess is that cultivar decisions will be made based on either past experience or lint yield data from on-farm or official variety trials. Additionally, any seed traits that could affect seed or seedling vigor were determined through either selective breeding, seed crop management, environment ecountered during seed development, or conditions during seed processing and storage. In other words, most of these things are beyond the control of the grower and have been determined by the time the grower has a bag of seed in hand. If growers are forced to plant some of their cotton acreage into less than ideal conditions, planting particular varieties/lots with traits that are indicative of high vigor may be beneficial. More importantly, as a community of cotton researchers, extension specialists, agents, consultants and growers, we know there are things that we can control. In a previous newsletter from a couple of years ago, I boiled this down to a few "oversimplifications", and I've chosen to revisit them in the current newsletter.

Cotton doesn't like it when it's cold, so plant when it's warm: Chilling temperatures (above freezing but less than 50 °F) in the initial hours after planting can lead to abnormal root development and should be avoided. The current recommendation is for planting to occur when soil temperatures are 65 °F or above for three consecutive days and when 50 DD60s are projected to accumulate within five days after planting. These conditions are conducive to rapid germination and vigorous seedling growth. Keep long term trends in mind as well. It may be possible to get a crop out of the ground, but if DD60 accumulation is low in the weeks following emergence, the crop will take longer to develop.

Too much or too little water limits stand establishment: Waterlogging suffocates plants by depleting the soil of oxygen. Having a well-aerated seed bed and avoiding excessively wet soil conditions via planting date selection and knowledge of field history can help lessen these problems. Low soil moisture at planting can lead to seedling desiccation, and obvious remedies for this situation include post-planting irrigation for fields in which irrigation is available or planting into good soil moisture for dryland fields and knocking beds down at planting to minimize water loss from the upper portion of the soil profile before planting. Planting depth affects moisture availability too. The current recommendation in Georgia is to plant seed at a 0.5 to 1 inch depth. Deeper planted seeds have access to more soil moisture, but risk of stand loss increases with depth. Vigor differences between varieties or seed lots will likely matter more in these situations.

If you've got crusting, get a rotary hoe soon: Crusting is when a thin compacted soil layer forms over a field. The reason this is a problem is because the cotton seedling often cannot exert enough pressure to break through the crust. If this crust isn't broken up in time, the grower may be looking at a replant situation. A rotary hoe would only be used where crusting was a widespread issue in the field, but timing matters. As a general rule, a rotary hoe should be run within 10 days after planting to ensure that plants don't just sit under the soil surface and rot. However, I have also had good luck using a rotary hoe as late as 15 days after planting, provided the seedlings I dug up exhibited normal development (a well-developed seedling radicle, pronounced hypocotyl hook, and no visual evidence of disease). The best thing to do is dig up some plants and see what you're dealing with before making the decision to use a rotary hoe.

Make sure equipment is ready for planting: Incorrect planter setup can lead to 1) poor seed to soil contact, which could limit imbibition and germination and 2) inaccurate depth settings which could result

in embryo dehydration if planted too shallow or inability of the seedling to reach the surface if planted too deep.

Take-home message: Cotton varieties and seed lots can vary in their potential for rapid and uniform emergence across a range of conditions (seed vigor) or their potential for post-emergence seedling growth and survival (seedling vigor). *Potential* is the key word here, meaning that uniform emergence and vigorous seedling growth are not guaranteed, even for bags of seed with the potential for "high vigor." A vigorous lot of seed that is planted too deep or when it's too cold, too wet or too dry can still fail to emerge. If early seedling pathogens are not considered prior to closing the furrow (as Dr. Kemerait will undoubtedly tell you), high seed vigor becomes irrelevant as uniformly emerged seedlings begin to die off, leading to skippy stands. Plant and insect pests can reduce seedling growth and survival, even if plant stands are close to their potential. Readers are referred to other portions of this newsletter and the Georgia Cotton Production Guide for more detailed, early-season crop management considerations.

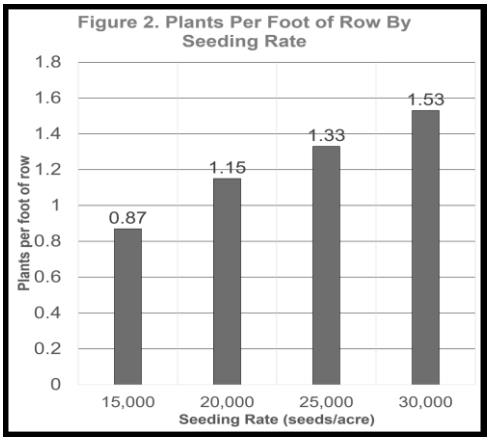
References

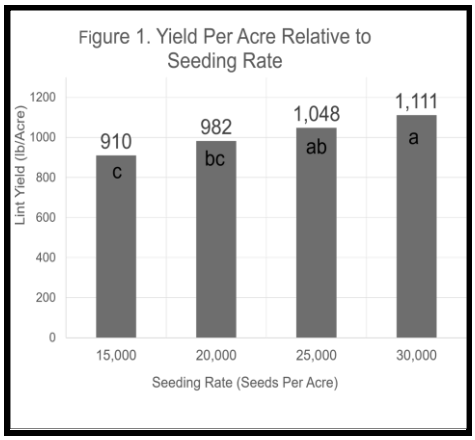
Bourland, F., 2019. Functional characterization of seed and seedling vigor in cotton. J Cotton Sci 23, 168-176.
Pilon, C., Bourland, F., Bush, D., 2016. Seeds and planting. In: Snider, J.L., Oosterhuis, D.M. (Eds.), Linking physiology to management. The Cotton Foundation, Cordova, TN, pp. 67-84.
Snider, J.L., Collins, G.D., Whitaker, J., Chapman, K.D., Horn, P., Grey, T.L., 2014. Seed Size and Oil Content Are Key Determinants of Seedling Vigor in *Gossypium hirsutum*. J Cotton Sci 18, 1-9.

Deciding on an ideal seeding rate (*Wade Parker*): As I talk to agents and growers around the state; I have heard a lot of talk about how tough this year is going to be and how survival is the top priority. While all commodities are down, it seems like more growers are talking more about cotton's economic challenges. Many are realizing or have already realized how tough it is going to be to at least break even or how to mitigate losses. I think the two main inputs that farmers are always eager to cut are seed and fertilizer. These two input categories do not need to be "cut," they need to be adjusted for efficiency. Let's focus on seeding rates. Agent counter parts and I have conducted replicated seeding rate trials at multiple locations for the past two years. The trials evaluated four different rates: 15k, 20k, 25k, and 30k, with stand counts and yield taken at each location. With respect to stand establishment all locations averaged at least >75% with some of over 80% emergence for all treatments. Stands with these percentages can sometimes warrant replanting, especially with the lower seeding rates. However, what matters most is the net revenue return per acre. For 2023, when comparing the 15k to the 30k rate, the difference in yield was 201 lbs./A and a difference of .66 plants/Ft of row for the positive. The grower increased net revenue $78.70 (.82/lb) per acre by using the 30k rate, which was 2.2 seed planted per foot of row.

For 2024, the 15K seeding rate was the only treatment that was statistically different in terms of yield, while the 20k, 25k and 30k were the same and the 25k had a final plant stand improved by .5 plant per foot of row over the 15k. The revenue was increased by $69.96 (.68/lb) per acre by planting the 30k rate.

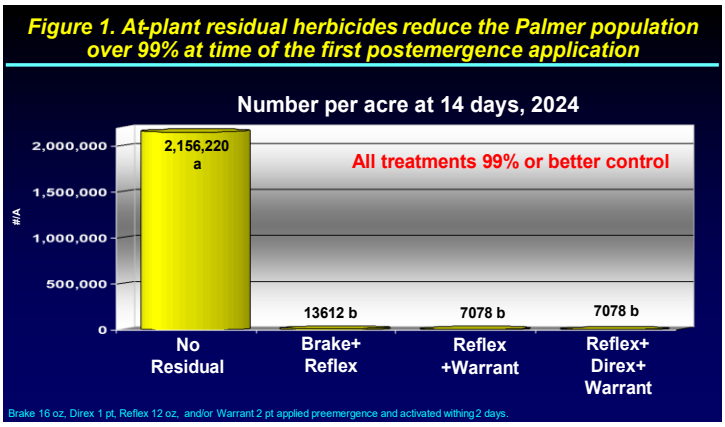
Everybody has their opinion on a given seeding rate, but according to the data, the best rate is somewhere between 25k-30k. I still stand by our 2.5 seed per foot of row recommendation, which has stood the test of time. I have witnessed many growers plant low rates and do ok, but they are gambling on soil not crusting, minimal seedling disease loss and minimal deer damage. Gambling on the deer is the riskiest, as no grower wants to absorb the cost of replanting regardless of the market price. Those three-foot skips are hard to overcome, as they receive the same amount of inputs as the rest of the field! *The graphs below exhibit the stand count and yield data from the 2023 trials.*





At-plant residual herbicides remain essential for success (*Stanley Culpepper and Jenna Vance*): For nearly two decades, Georgia research has consistently highlighted how effective applying a combination of at-plant residual herbicides are in reducing the number of Palmer amaranth (and many other weeds) that emerge in the cotton crop.

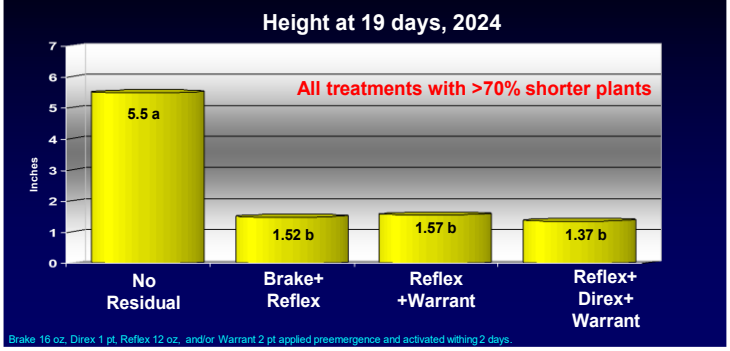
In fact, farmers effectively controlling our more problematic weeds like Palmer amaranth, goosegrass, and/or spiderwort have mastered the concept of starting clean, applying at least two-residuals (both effective on the more problematic pests) at-planting and then continuing to overlap residuals throughout the season with timely postemergence applications.



In 2024, three residual combination treatments were compared (many other equally effective options exist) and again Palmer control exceeded 90% for the entire season with control over 99% for 2-3 weeks after application and activation (Figure 1).

One point that we have not always highlighted historically is that these residual herbicides also often slow the growth of weedy plants that will eventually escape through the herbicide layer (Figure 2). Obviously, slower growth facilitating a smaller weed size at time of the postemergence application should improve coverage and control.

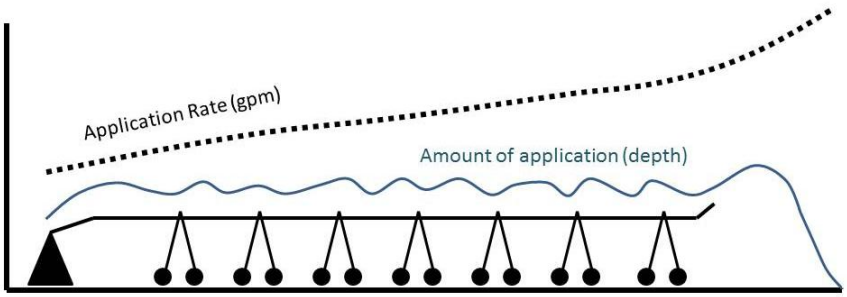
Figure 2. At-plant residual herbicides reduce Palmer height at time of the postemergence application.



When it comes to economics, its hard to beat the at-plant residual when considering the number of plants you never have to deal with in the first place coupled with the escapes growing a little more slowly.

Irrigation system prep and early season water requirements for cotton production (*Wes Porter, David Hall, Jason Mallard, Phillip Edwards, and Daniel Lyon*): Corn planting is wrapping up and it's time to move into cotton and peanut. This season may be difficult with lower cotton prices and high input costs, so we need to focus on areas where we can maximize our efforts. Producers must not forget the fundamentals and basics of irrigation efficiency. 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 and prepared for the season. 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. Center pivot irrigation systems are built for precision application of water to the crops. It is important to be sure if nozzles are replaced we use the exact design as the original. 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. Depending on your water source and quality, it may be necessary to replace nozzle packages every 5 to 10 years.

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 (Figure 2) 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. 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 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. Cotton responds negatively to ill-timed and over-applied irrigation during critical growth periods, usually causing yield reductions. 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), meaning profit is lost. An example of this is seen from the 2020 growing season in Table 1 below. Once planters start rolling, time becomes very valuable. If you are considering utilizing advanced technologies for irrigation scheduling, now is the time to download apps and/or make arrangements for purchasing or leasing or obtaining equipment through a dealer or consultant. As seen below in table 1, maintaining optimal soil moisture levels throughout the season helps achieve better yields. Optimal levels of soil moisture are not obtained by "feeling the soil" or "visible plant stress." In years where commodity prices are lower, achieving the best yield possible can help. For more information about either of these contact your local county Extension Agent.

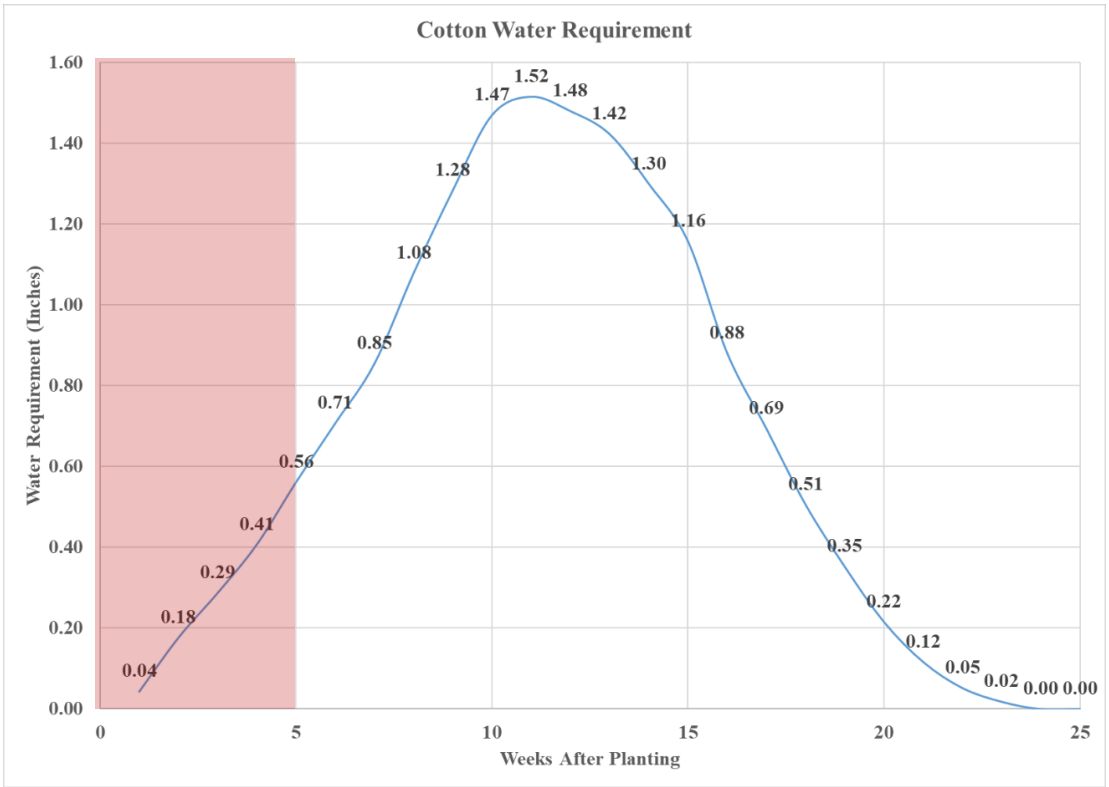


Figure 2. Seasonal Cotton Water Requirement.

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.

UGA Extension has developed a quick and easy irrigation scheduling guide that is laminated and contains the four major row crops grown in Georgia. The guide can also be downloaded at Irrigation Reference Guide for Corn, Cotton, Peanuts, and Soybeans | UGA Cooperative Extension.

Further questions about early season cotton irrigation and specific situations should be directed to your local UGA Extension County Agent.

Table 1. 2020 Cotton irrigation scheduling data when 21.4 inches of rainfall were received, showing that more advanced methods provide higher yields and IWUE.

Treatment	Irrigation (in)	Total Water (in)	Lint Yield (lb/ac)	IWUE (lb/in)
Rainfed	1.0	22.4	795	N/A
45 kPa	5.5	26.9	1304	237
20 kPa	7.75	29.1	1293	167
75 kPa	3.25	24.6	1129	347
Irrigator Pro	5.5	26.9	1245	226
Valley Scheduler	8.5	29.9	1240	147
SI Cotton App	6.25	27.6	1270	203
Checkbook	11.0	32.4	1196	109

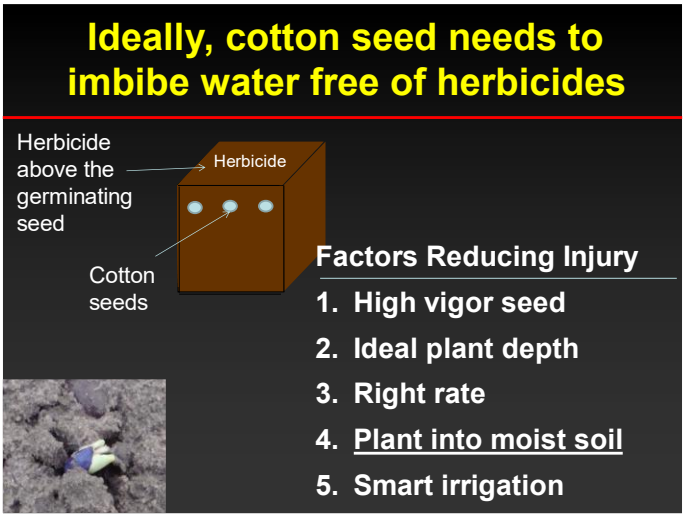
A few tips to reduce residual herbicide injury (*Stanley Culpepper and Jenna Vance*):

A. Herbicide rates drive crop damage, much experience has likely guided you to the ideal rates for your soil type by now, but if not, contact your local Extension office for our help.

B. The faster the plant emerges from the soil, the lower the expected injury.

C. High vigor seed will help mitigate injury.

D. Hit the sweet spot on planting depth; too shallow and the herbicide gets to the seed at too high of a concentration, but placing the seed too deep means the seedling is potentially weak and



vulnerable. Dr. Hand suggests a depth between 0.5 and 1 inch!

E. PLANT YOUR SEED into moist soil if any way possible!!!!! This one is often hard to accomplish but extremely beneficial for rapid emergence and minimal herbicide injury.

F. Apply your preemergence herbicides within 24 hours of planting.

G. For those with irrigation, irrigate to activate your herbicide within 24 hours of application and at least 48 hours prior to cotton cracking (we need to avoid damage from splash).

H. Be familiar with how much water the products you are using need for activation; for example, Reflex requires about half the amount of water compared to what a product like Brake needs.

I. Choosing to irrigate versus waiting on a rainfall to activate the herbicide can be very beneficial. A gentle irrigation versus a downpour moves the herbicide into the soil improving weed control, reducing runoff when that first heavy rain arrives, reduces the potential for splash during cotton emergence, and provides you the ability to control how deep the herbicide moves in the soil profile… keep it above the seed until that root is heading south.

J. After the cotton is up and the herbicide is working, limit irrigations to only what the crop needs to extend the life of your residual herbicides.

K. If "dusting" cotton in, probably should not use a residual at-plant as it is impossible to get water to the seed without herbicide. Initiate a postemergence + residual program as soon as the cotton has fully emerged.

Important Dates:

Georgia Cotton Commission Mid-Year Meeting - Statesboro, GA – July 23, 2025
Southeast Research and Education Center Field Day – Midville, GA – August 6, 2025
Southwest Research and Education Center Field Day – Plains, GA – August 13, 2025
Cotton and Peanut Research Field Day – Tifton, GA – September 3, 2025
Georgia Cotton Commission Annual Meeting and UGA Cotton Production Workshop - Tifton, GA – January 28, 2026