UNIVERSITY OF GEORGIA EXTENSION

UGA Cotton Team Newsletter
April 2024

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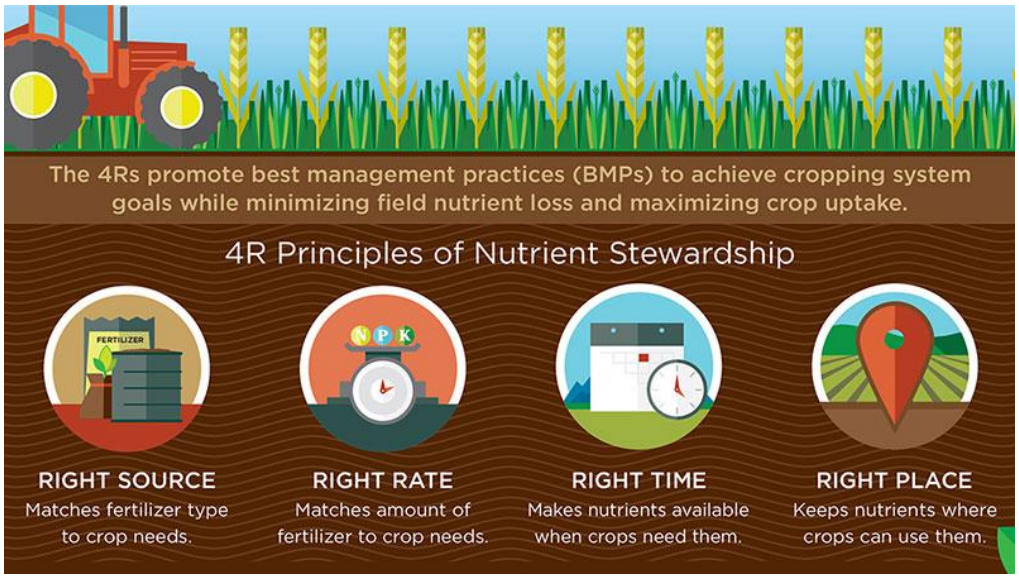
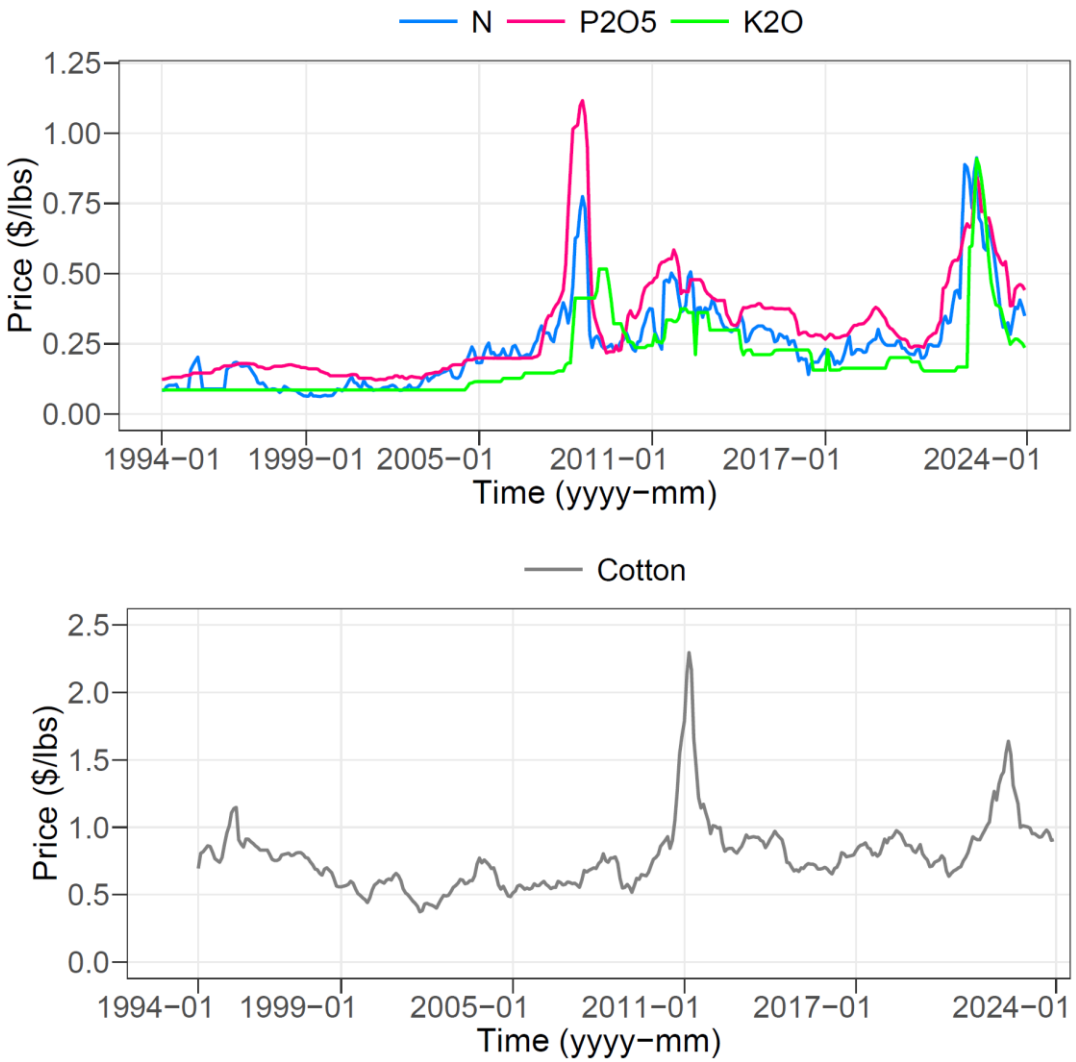
Considerations for nutrient management in cotton (*Henry Sintim and Glen Harris*): Although fertilizer prices have gone down compared to previous years, there is still the need to efficiently manage nutrient application to increase crop productivity, while minimizing adverse impacts on the environment. The prices of N, P2O5, and K2O are getting closer to the pre-COVID-19 levels. Unfortunately, cotton prices have also gone down compared to the previous year, reducing the profit margins for growers.

While cotton prices are down, we do not recommend cutting down on fertilizer simply to save on production input costs. The 4Rs of nutrient stewardship should inform nutrient management decisions. Ensuring that fertilizer type and amount are matched with crop needs, and applying them at the recommended timing, especially split application of nitrogen



would help improve nutrient use efficiency and overall crop productivity. It is important to collect soil samples and have soil test analyses completed. This will give insight into the nutritional status of the soil and also determine the fertilizer and lime requirements.



The figure shows the monthly prices of N, P2O5, K2O, and cotton for the past 30 years (January 1994 to December 2023). The N, P2O5, and K2O prices were derived from the prices of urea, TSP, and KCl, respectively. All commodity prices were obtained from IndexMundi (https://www.indexmundi.com/commodities/).

The University of Georgia Extension fertilizer recommendations for cotton are based on yield goals and soil test reports of analyses with the Mehlich I extraction method. UGFERTEX is a Windows-based online system for formulating prescription lime and nutrient guidelines for agronomic crops in the state. UGFertex can be accessed on the UGA-AESL website (https://aesl.ces.uga.edu/calculators/ugfertex/). Note that the recommendations are based on Mehlich I

extraction so do not follow the recommendations if your soil was analyzed with other methods, such as Mehlich III, which is becoming popular among neighboring states. In fact, some Georgia growers have switched to the Mehlich III method, with some common reasons being (a) I have heard the Mehlich-3 is a better test, (b) my grower friends in other states use Mehlich-3 so I decided to switch to Mehlich-3, (c) I like the Mehlich-3 test because it reports the soil has more nutrients making me cut down on fertilizer, just to mention a few. Routine soil test analyses do not measure the total amount of nutrients in the soil but provide an index of the nutrient-supplying capacity of the soil. In other words, a soil test predicts the amount of nutrients that will be made available from the soil by using soil test extractants intended to mimic the actions of roots in plant nutrient uptake. Below is a table showing the nutrient values for Mehlich-1 extraction and nitric acid-hydrogen peroxide digestion of soils sampled from Sumter and Tift Counties in Georgia. As can be seen, nutrient values after soil digestion are consistently greater than Mehlich-1 for both soil samples. Thus, **the amount of nutrients extracted by a particular soil test extractant is not as important as its ability to provide a reliable index of nutrient availability.**

Nutrient values of soils sampled from Sumter and Tift Counties in Georgia

Extraction Method	**P lbs/ac**	**K lbs/ac**	**Mg lbs/ac**	**Ca lbs/ac**	**B lbs/ac**	**Zn lbs/ac**	**Mn lbs/ac**	**Fe lbs/ac**	**Cu lbs/ac**
	Tift County soil								
Mehlich-1	55.7	103	105	1,038	0.40	4.07	103	44.0	0.57
Digested	338	352	342	1,233	6.30	15.9	675	9,430	4.87
	Sumter County soil								
Mehlich-1	31.0	122	217	964	0.90	3.87	196	53.0	0.63
Digested	621	608	732	1,260	3.94	43.2	1,124	44,762	13.6

The UGFERTEX provides fertilizer recommendations based on the soil type, which is determined by the county. Below is a sample report generated with UGFERTEX for cotton with a lint yield goal of 1500 lb/ac and for typical Coastal Plains soil. Recent studies in Georgia show that even though modern cotton cultivars are efficient in nutrient uptake and assimilation, the fertilizer recommendations still hold, and do not call for reducing the nutrient application rates. The efficient utilization of nutrients by modern cotton cultivars is reflected in their better yield than older cultivars. Cutting down on fertilizer will therefore imply you would want to make similar yields as the older cultivars.

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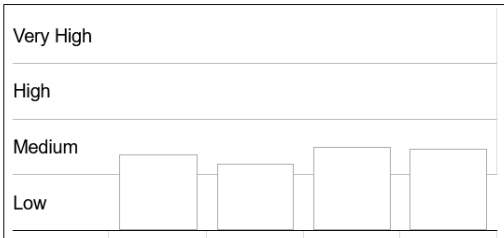
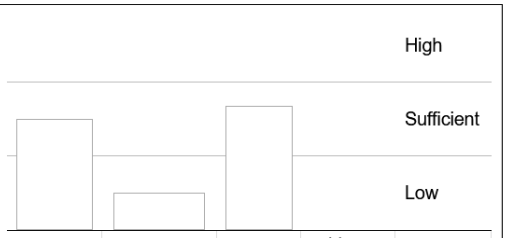
UGFertex-Based Nutrient Application Guidelines

Client:	**Blank**	Field ID:	**LF-10211**
County:	**Tift**	Date:	**3/20/2023**
Soil Group:	**Coastal Plain**	Plow Depth:	**8** inches
Crop:	**Cotton**	Previous Crop:	**Corn (New Ground) - Irrigated**
Yield Goal:	**1500 lbs**	Irrigated:	**Yes**

Results





Soil Test Index	Phosphorus	Potassium	Calcium	Magnesium	Zinc	Manganese	Soil pH	Lime Buffer Capacity	Soil Test Index
	41 lbs/Acre	**89 lbs/Acre**	**621 lbs/Acre**	**44 lbs/Acre**	**3 lbs/Acre**	**5 lbs/Acre**	**6.2**		

Buildup:	Soil P: **0**	P_2O_5 Required: **0** lbs/a/year	Years Required For Buildup **1**	Starter:	N:	**0**
	Soil K: **0**	K_2O Required: **0** lbs/a/year			P_2O_5:	**0**

Lime and Nutrient Guidelines

Limestone	Nitrogen (N)	Phosphate (P_2O_5)	Potash (K_2O)	Calcium (Ca)	Magnesium (Mg)	Sulfur (S)	Boron (B)	Manganese (Mn)	Zinc (Zn)
0 tons/Acre	**95** lbs/Acre	**80** lbs/Acre	**100** lbs/Acre	**0 lbs/Acre**	**0 lbs/Acre**	**10** lbs/Acre	**0.5** lbs/Acre	**10** lbs/Acre	**0** lbs/Acre

Comments

If rank growth has occurred in this field in the past, decrease the N rate by 25 pounds/acre. Apply 1/3 to 1/2 of the recommended N at planting and the remainder as sidedress application(s) at first square to first bloom.

If vegetative growth has been inadequate in this field in the past, increase the N rate by 20 pounds/acre. Nitrogen in excess of 100 pounds/acre may be detrimental if insect control is inadequate.

When S is recommended, apply it with the sidedress nitrogen application. The boron (B) can be applied with the fertilizer or it can be applied in two applications of 0.25 pound B/acre with the insecticide sprays.

Soil test results indicate deficiency of Manganese is possible. For confirmation, take a leaf blade sample for analysis between first square and first bloom, and correct with foliar applications if needed.

A cheaper source of nutrients that we highly recommend for growers, especially row crop growers, is poultry litter (manure mixed with bedding material). Georgia continues to be the leading producer of broilers in the United States for the past decade, with production of 1.3 billion heads in 2022. According to the Georgia 2024 Ag Snapshot, broiler production contributed $6.7 billion to the agricultural economy of the state, and approximately, three out of every four Georgia counties are involved in poultry and egg production [4]. Poultry litter is therefore a readily available nutrient source for land application, and it typically contains approximately 3% N, 3% P_2O_5, and 2% K_2O (fertilizer value of 3-3-2). On average, 60% N, 80% P, and 80% K of the nutrients in the poultry litter are expected to be

available in the first year. The nutrient content of litter varies significantly depending on moisture content, type of bird, feed ration, and especially storage and handling methods. Therefore, it is highly recommended that litter be analyzed for nutrients by a reputable laboratory before determining application rates and value. Also, consider applying poultry litter as pre-plant incorporated, and closer to the planting season, to get the most value and reduce nutrient losses.

Poultry litter being spread on a cotton field using a small mechanical spreader. Photo by H. Tewolde (CSA News Release; https://www.crops.org/news/media-releases/releases/2016/1012/835/).

Planter preparation (*Wes Porter and Simer Virk*): As the warm spring continues to increase soil temperatures, corn planters will start rolling across the fields. 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. While some of the planters may have already been used to plant corn, **it's important to note some significant changes in planter settings are required to ensure accurate metering and seed placement for cotton**. 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 Planter Checklist (UGA) for growers to utilize 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 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). 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). 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 – 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 cotton 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.

Early season disease and nematode issues for cotton farmers – You get one chance (*Bob Kemerait*): Some of important problems cotton growers will face in 2024 demand attention at the beginning of the season or not at all. The decision to plant a nematode-resistant cotton variety, the decision to use a nematicide, and the decision to plant a bacterial-blight resistant cultivar are all made by the grower, but can only be made once. Growers should carefully consider the opportunities available to them before the furrow closes.

Plant parasitic nematodes, to include the southern root-knot, the reniform, the sting, and the Columbia lance nematodes, are important pests that reduce yields in our cotton fields across Georgia every year. Seedling disease, especially when caused by *Rhizoctonia solani*, and, to a lesser degree, *Pythium* and other fungal pathogens, is a potential problem in every field every year. To combat nematodes and protect seed and seedlings against disease, essential decisions must be made very early in the season, prior to or at the time of planting. Prior to closing the furrow, growers have opportunities to protect their seed and plant-stands in ways that have impact on the yield potential for the remainder of the season. The following is a "laundry list" of actions that a grower MUST consider in order to protect the seeds and cotton seedlings.

1. There are several important fungal pathogens that can cause both pre-emergent and post-emergent stand loss in a cotton field. In Georgia, *Pythium* species are can be commonly associated with "pre-emergent damping-off" where the seedling dies before cracking the soil surface. The most common seedling disease of cotton in Georgia is "soreshin" caused by *Rhizoctonia solani*. "Soreshin" is a post-emergent seedling disease and is easily recognized by seedlings that wilt and

die within a week or two. Protecting the young plants from seedling diseases is a three-step process.

a. The first step, where possible, is to plant high-quality seed with a strong, documented, germination rate. It is difficult, if not impossible to recover when poor-quality seed is planted.
b. The second step is to plant under conditions that result in rapid, uniform germination and vigorous growth. Cool, and wet soils, or planting just ahead of a cold rain, can slow germination and plant growth. Such gives the fungal pathogens, "the bad guys", the chances to play catch-up with the peanut seeds and seedlings, infect and then damage them.
c. The third step is to ensure that the seeds are well-protected with a fungicide seed treatment. All commercial seed will come pre-treated with a "base" fungicide package. The base package varies among different seed companies, but is always composed of a mix of three-to-four fungicides that have proven efficacy against common pathogens like *Rhizoctonia*, *Pythium*, and *Fusarium*.
d. From my studies, in approximately four-out-of-five years, use of the "base" fungicide treatment alone results in stands and yields similar to where additional fungicide seed-treatments or in-furrow fungicides are applied. However, investment in extra "insurance" with additional seed-treatments or, especially, in-furrow fungicides may be beneficial. "Extra" fungicide seed-treatments are more convenient to use; in-furrow fungicides may be more effective as they can be used to treat the seed and the soil surrounding the seed as well. Growers are most likely to observe a benefit from "extra" treatments where risk to seeding disease is elevated, such as when planting into cool and wet soils or conservation tillage. Additional seed protection may also be beneficial when planting at reduced seeding rates or where seed-quality is thought to be an issue.

2. Nematodes can be devastating to a cotton crop. Southern root-knot and sting nematodes are especially problematic in sandier fields of in sandier areas of a field. Reniform nematodes tend to be more problematic in "heavier" soils which have higher levels of silts and clays. The best way to identify a nematode problem is by taking soil samples at harvest, or, in some cases, by examining roots of affected plants. Areas in a field, especially sandier areas of a field, where plants remain small and stunted despite adequate moisture and soil fertility, may be affected by nematodes.
    a. Growers can minimize damage from southern root-knot and reniform nematodes by a) planting a resistant variety, b) by fumigating with Telone II, c) by using Velum (6.5-6.8 fl oz/A), AgLogic 15G (5-7 lb/A), or Averland FC (6 fl oz/A) in-furrow at planting, or by d) using one of several seed-treatment nematicides.

b. Growers can apply Vydate C-LV or Return XL at the 5th-to-7th true-leaf stage to compliment the earlier nematicide treatments.

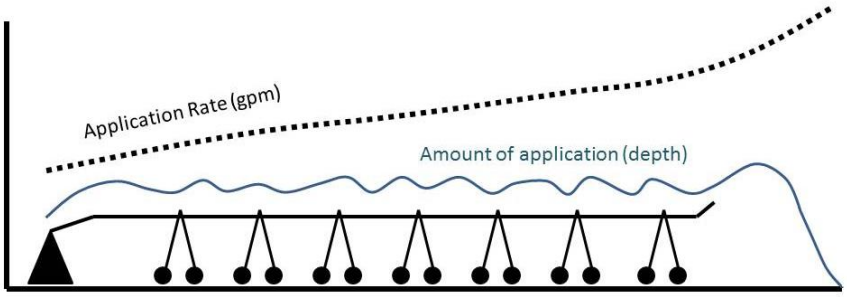
3. Fusarium wilt, caused by *Fusarium oxysporum* fsp. *vasinfectum*, is a significant problem in some fields in Georgia. Here in the southeastern United States, Fusarium wilt occurs as a complex of the fungus and nematodes, especially the root-knot and sting nematodes. Effective management of Fusarium wilt requires that growers protect their cotton with effective nematicides, such as those noted above.

4. Bacterial blight has not been a significant problem since 2017; however, the problem can still occur in some fields under favorable conditions. The only tactic to fight bacterial blight is to plant a bacterial-blight resistant variety.

Cotton farmers have the opportunity prior to and at planting time to manage important disease and nematode problems. These problems include seedling diseases and seed rots, nematodes, Fusarium wilt, and bacterial blight. Growers are encouraged to carefully consider their options and to make informed decisions to best protect their cotton crop at this critical part of the season.

Irrigation system prep and early season water requirements for cotton production (*Wes Porter, David Hall, Jason Mallard, Phillip Edwards, and Daniel Lyon*): 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 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. 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 a few small irrigation applications. The red box below represents the first five weeks of cotton water requirements after planting. Keep 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 over-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) 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.

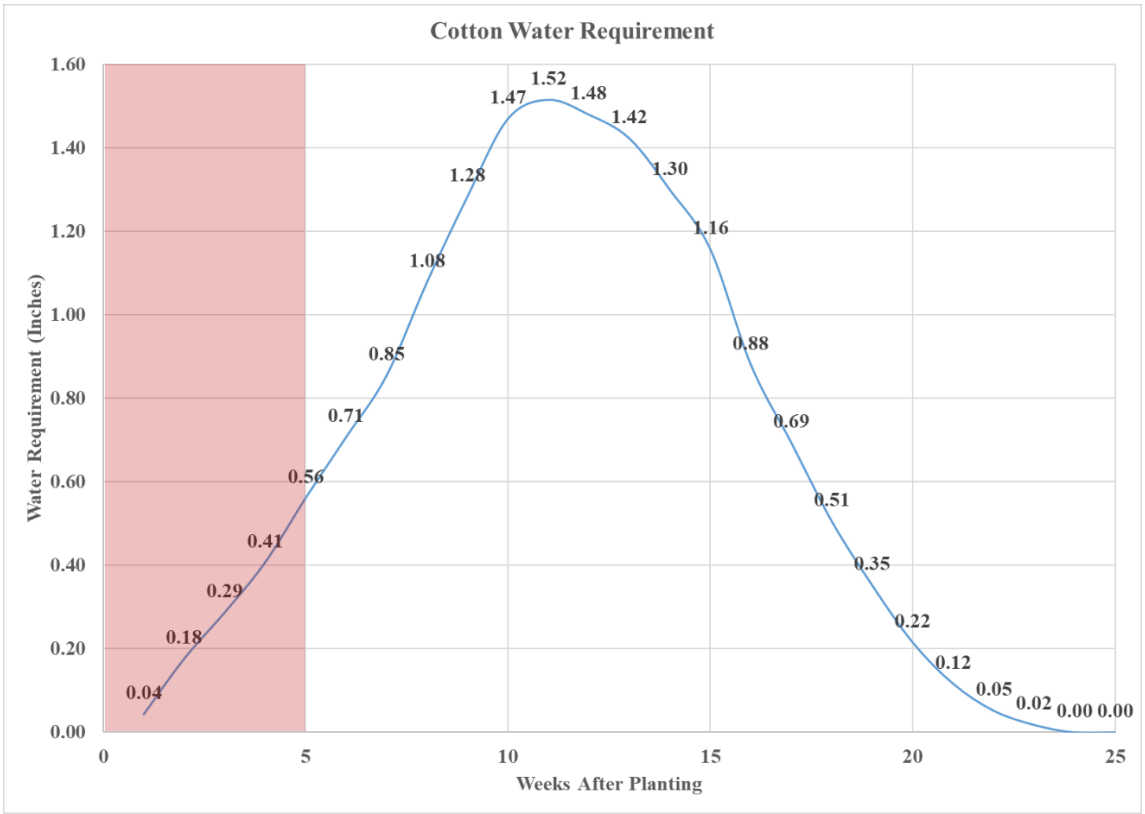


Figure 2. Seasonal Cotton Water Requirement.

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 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

Early planting considerations (*Wade Parker*): I know I am getting to be one of the older agents in Extension, but I can remember the 90's when cotton was making a comeback in the Southeast and especially Georgia. During this time, you always heard people with knowledge encourage early or timely planting of cotton, mostly due to the threat of frost or freeze. As time marched on, frosts seemed to arrive in my area around November 15 +/-. As this became the norm, growers got complacent and started planting later. The operation of planting later was compounded with the increase of Tomato Spotted Wilt Virus in peanuts, high thrips population, poor planting conditions, and projected weather delays. The last two years have brought an earlier than usual frost, including a 30^0 and 33^0 F minimum temperature recorded on October 19, 2022 and November 2, 2023 respectively *(UGA Weather Monitoring Network, Midville Experiment Station).* These two dates are not that far apart. I am not advocating that growers do something that does not fit their operation or are not comfortable doing. I am suggesting that growers who have sustained yield losses, due to frost or other factors related to delayed planting, to reevaluate their options.

If growers are interesting in at least bumping up their planting date, there are a few things to keep in mind. Pay close attention to DD60s or simply put daily heat unit accumulation. The general rule of thumb is 50 to 60 heat units are required after planting to achieve emergence. The plant will also need to accumulate 6-10 DD60s per day for the next week after planting. Soil temperature needs to be consistently above 65^0 F with moist conditions. Both soil temperature and DD60s can be accessed and monitored on our weather network (georgiaweather.net), which is easy to use and valuable for agents assisting growers on these decisions. Even though some varieties show more vigor than others, cotton as a general rule lacks the ability to show early season competitiveness. Therefore, make it important to try to minimize herbicide

injury but maintain good weed control. Also added to the list is managing seedling diseases and thrips, as both complexes are more likely to occur earlier in the season. It was stressed in county meetings last year, that the use of the new ThryvOn technology would be a good fit for this type of system. Fortunately, there are other tools in the tool box for all of these pest management issues.

The purpose of this article is to make you aware that planting early or earlier relative to a prior date can take more thought and management, but if successful will help ward off the possible loss of an early frost. If you have a grower that complains about losing yield due to early cold weather, help them figure out a plan to alleviate this. You don't have to plant 100% of your crop in April, not saying that, but maybe spreading out risk is a real possibility. As planting enters the month of June, research shows a steady decrease in yield as the month progresses. At the end of the day, no system is risk free. All we try to do is mitigate.

Physiological considerations in the early season (*Josh Lee, John Snider, Jayson Wisekal, and Camp Hand*): The anticipated wait for the 2024 cotton season is almost over, and planting season is about to start. In each season there are factors that we can control such as ensuring all planting equipment is functioning properly, pivots are functioning properly (if on irrigated acres), and all having all the essentials for planting (seed, fungicides, herbicides, etc.), but one aspect that we cannot control is the weather. However, smart decisions can be made with a little planning and technology. Abiotic factors play an important role in determining the success of a cotton crop. Temperature, oxygen, and moisture (TOM) is a simplified acronym used to express the requirements for seed germination and stand success. In this section, we'll discuss the role of TOM in cotton germination and emergence.

T-Temperature:
Cotton requires warmer temperatures for growth and development. Georgia's planting window starts in April and runs through June. However, chilling temperatures below 50°F can still be observed at early planting dates. Favorable planting conditions are when the top 4-in soil temperatures reach 65°F for three days with predicted warm temperatures over the next several days. The accumulation of heat units needed for plant growth and development is referred to as DD-60s. DD-60s are calculated by the following formula:

$$DD\text{-}60s = [(Tmax + Tmin)] - 60°F$$

For optimal germination and development, an accumulation of 50 DD-60s are required within the first 5 days after planting. The Cotton Planting Conditions Calculator by North Carolina State is a great tool for estimating DD-60s and future weather conditions https://products.climate.ncsu.edu/ag/cotton-planting/. Similar resources can be found at http://www.georgiaweather.net/.

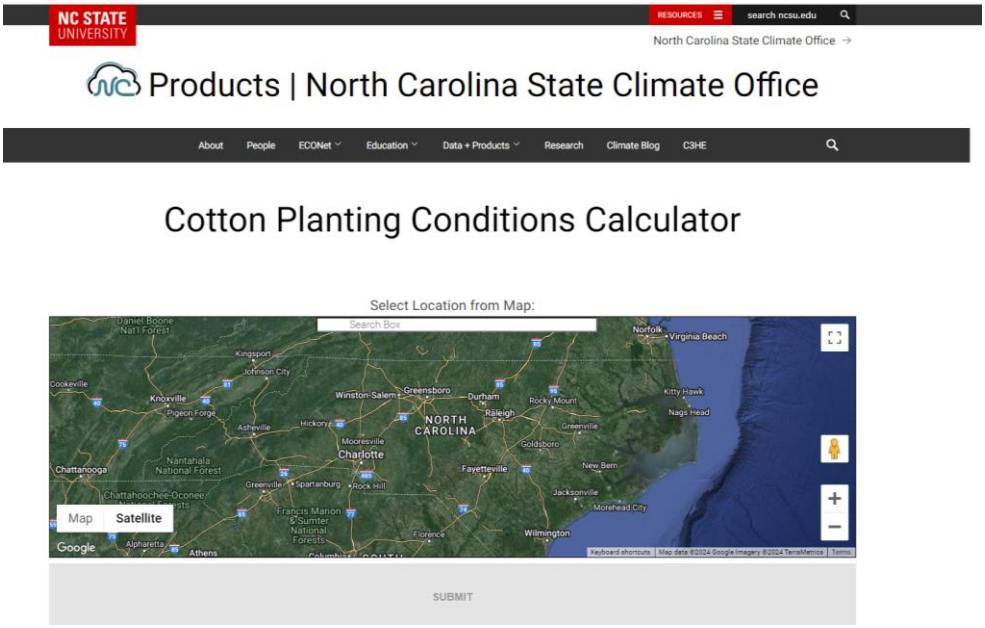


Image 1: NCSU cotton planting conditions calculator homepage.

O-Oxygen:
Oxygen is required once the seed embryo begins to use stored energy reserves (oil and protein) to fuel growth. Rapid oxygen uptake by the germinating embryo typically occurs after the seed takes up water from the surrounding soil, which is known as the imbibition phase. Standing water present soon after planting can limit the amount of oxygen available to the seed, and if soils remain saturated for too long, the seedbed can become completely anoxic. As a result, waterlogging conditions rob young seedlings of the oxygen needed for aerobic cellular respiration, causing young seedling death. Before planting, take a look at the weather forecast and make appropriate decisions.

M-Moisture:
Planting in adequate soil moisture conditions with a well-aerated seedbed sets the crop up for success and forms the foundation of yield potential. As mentioned in the oxygen section, too much water can cause young seedling death. Dry soil conditions can also be problematic for stand establishment. As noted above, imbibition is the first thing that happens to a seed when it is placed in the soil. Because a cotton embryo is relatively dry (8 to 10% moisture), the seed will readily take up water from the surrounding soil. However, as the embryo begins to grow, it's moisture content increases, and if the surrounding soil dries out after planting, the seedling may stop growing before it reaches the soil surface. To minimize these potential problems, post-planting irrigation is an obvious solution, but for dryland farmers, planting into good soil moisture is key, and it may be necessary to knock beds down at planting to minimize water loss from the upper layer of the soil prior to planting. Drying of the upper soil layer after a rainfall or irrigation event can cause soil crusting, which prevents the hypocotyl from pushing through the soil and pulling the cotyledons above the soil surface. If crusting is a problem, it is important to walk the field and dig a few plants up for inspection to determine if healthy seedlings are present just below the soil surface. If so, a rotary hoe can be run over the field to break up the soil crust and promote emergence.

It is also important to check planting equipment to ensure that planted seed has access to sufficient moisture. Cotton seeds should have good seed-to-soil contact to promote imbibition and germination. Seed depth recommendations in Georgia are to plant at a depth of 0.5 to 1 inch. Improper seed depths can lead to embryo dehydration if planted too shallow, or seedlings may be incapable of reaching the soil surface if planted too deep. Please check out the planter checklist and information from Drs. Virk and Porter on planter preparation in this month's newsletter.

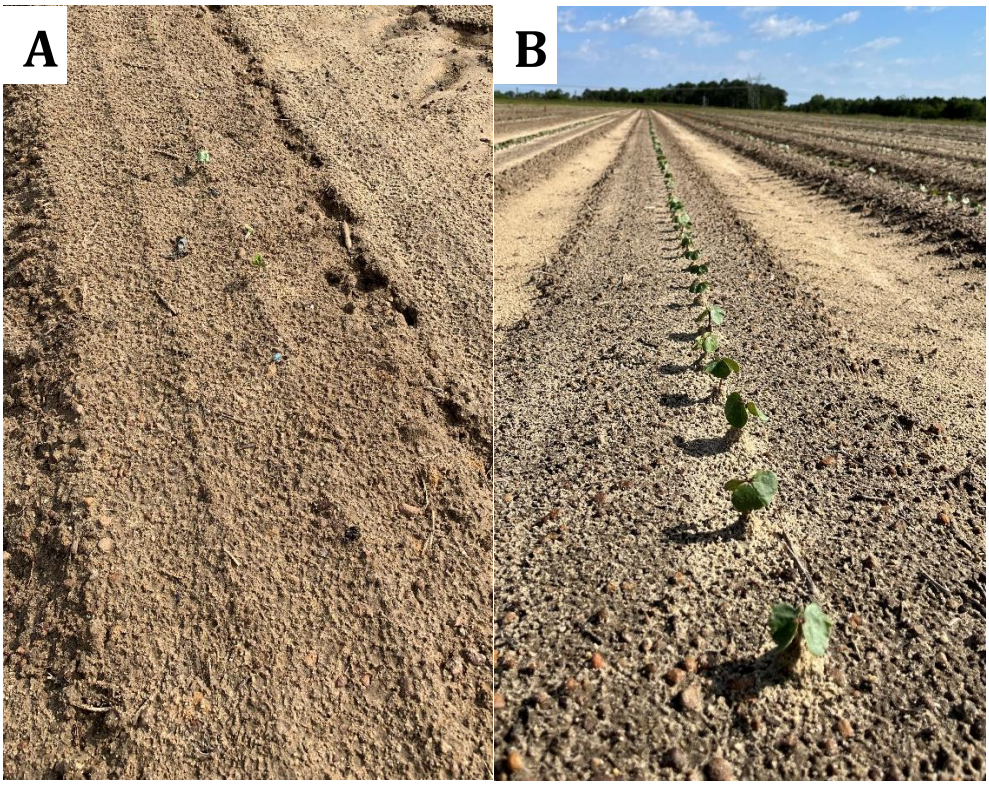
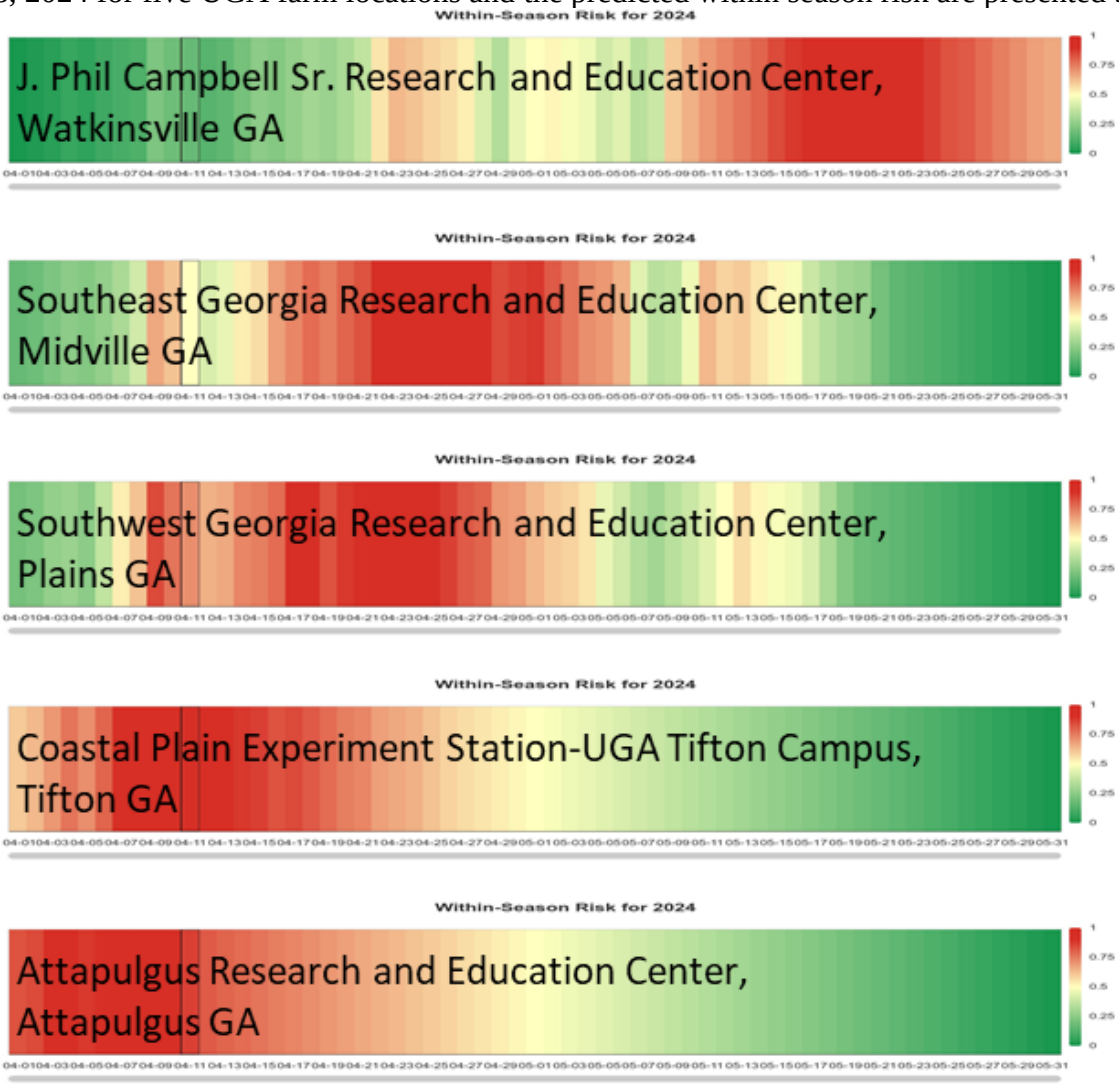


Image 2: Stand planted under poor environmental conditions (A), stand planted under ideal growing conditions (B). Photos by Josh Lee.

Thrips management: use a preventive treatment (*Phillip Roberts*): Thrips are a consistent pest of cotton and are the only cotton insect pests where a preventive treatment is recommended. Thrips infest near 100 percent of Georgia cotton and we consistently observe a yield response to preventive treatments at planting. Below are a few thoughts to consider as you make decisions for your at-plant thrips management program.

Use the **Thrips Infestation Predictor for Cotton-TIPs** https://products.climate.ncsu.edu/ag/cottontip/. TIPS is a web-based tool which predicts thrips risk by location and planting date. Thrips risk in the Coastal Plain of Georgia is generally higher on early planted cotton compared with later planted cotton.

However, planting dates with the highest risk varies by location and year. We ran the TIPs model on March 28, 2024 for five UGA farm locations and the predicted within season risk are presented below.



Because the scale is normalized within the current year, the predicted risk for a series of potential planting dates (April 1 thru May 31) ranges from least risk (dark green) to highest (dark red), regardless of whether the current year's risk is high or low relative to prior years. TIPs also displays risk by planting date in 2024 compared with the preceding 5 years. It is important that you run the TIPs model as you near planting; an abrupt change in weather will change the predictions. As of March 28, 2024, we tend to see the highest risk within season for thrips be delayed as location moves north.

So how can predicted thrips risk help you make better management decisions? Efficacy of preventive treatments for thrips varies. 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. The new transgenic technology ThryvOn provides excellent protection from thrips. We have conducted field trials with ThryvOn for several years and have never observed a planting which would benefit from a supplemental foliar insecticide. Position preventive treatments with the greatest activity and residual control in high thrips risk environments. Understand the need for supplemental insecticide applications will likely be needed if seed treatments are used and thrips infestations are high. Optimal timing of a supplemental insecticide for thrips is the 1-leaf stage. For example, if a seed treatment is used in a high-risk environment, it is likely a foliar insecticide may be needed to fully protect cotton. Knowing thrips risk is high may allow proactive planning to make timely applications if needed based on scouting.

Additional thoughts on thrips risk include tillage type and overall plant vigor. 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. Regardless, a preventive treatment should be used. 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.

Seedlings are most susceptible to thrips during early stages of development. 1-2 leaf cotton is more sensitive to loss of yield potential compared with 3-4 leaf cotton with the same number of thrips per plant. Cotton should be scouted for thrips and thrips injury until seedlings reach the 4-leaf stage and are growing rapidly. It is important that the seedlings are growing rapidly, if severe thrips injury is present on plants that are beyond the 4-leaf stage, to the point that the plant is not growing rapidly, a spray would likely be needed.

Variety selection and other considerations ahead of planting (*Camp Hand*): As we approach planting time for cotton, I always get excited. However, it does seem that there isn't a lot of excitement surrounding this crop season. Commodity prices aren't where they need to be and regulatory challenges are plentiful, but we must push forward and make the most of the situation we find ourselves in. I hope this newsletter serves as a tool to help you do that.

I attended the UPW training in Tifton on April 3rd, and afterwards in a conversation with a grower we talked about a lot of things pertaining to the training but we finished with him saying, "Well I'll start pestering you again in a couple of weeks when I'm trying to decide what variety to plant." Many may have made their variety selection decisions, but for those that haven't or for those that are going to be exchanging unopened corn seed for cotton seed, below are some of my thoughts on varieties.
Of course, if you heard me talk at production meetings, a large portion of my talk was on variety selection. The first thing I always talk about is the on-farm variety trial program we do for cotton at UGA. The results for 2023 can be found here. Although one year of results averaged across a lot of locations is good, multi-year data is better. We know that each year is not the same, and this was seen in the 2023 results, where a couple of the varieties that were near the top the last few years found themselves in the

middle of the pack. Therefore, it is vital to evaluate variety performance across multiple years. Below is the average yield of the 8 varieties we looked at for the last two years.

2022 - 2023 On-Farm Variety Trial Results
46 locations over 2 years

Variety	All Location Avg. Yield	LSD (P=0.1)	% Above Trial Avg.
ST 5091 B3XF	1,287	a	83
AR 9831 B3XF	1,279	a	65
DG 3799 B3XF	1,277	a	61
DP 2038 B3XF	1,260	ab	70
ST 4595 B3XF	1,250	ab	61
NG 3195 B3XF	1,234	ab	39
AR 9371 B3XF	1,227	ab	37
NG 4190 B3XF	1,191	b	28

Overall, the "top yielding group" encompasses 7 of the 8 varieties, with only 60 lbs./acre difference between them. However, we want to focus on consistency of these varieties. The top five yielding varieties also yielded above average 60% of the time or more, giving them the slight edge in consistency.

Another fantastic tool to evaluate variety performance is the OVT program at UGA. They evaluate more varieties than I would ever have the chance to look at, but do it in fewer locations. OVT results for cotton can be found here. Overall, these results largely agree with those produced in the on-farm program, but you can also find information on varieties we did not evaluate on-farm and varieties that are new. If you are considering newer varieties, technologies, or varieties that we haven't tested on-farm, I would highly recommend you look through the OVT data.

These are the two variety testing programs provided by UGA, and they provide great replicated, unbiased data. Seed companies also do internal testing, and I am sure that they would be willing to share their data with you if you were interested.

When it comes to new varieties and technologies, if you choose to try them I would do so on a limited basis (i.e. don't plant the whole farm in them). This goes with any new products or products that we haven't had a ton of opportunities to test. For example, DP 2333 B3XF was a new variety we evaluated in 2023, and while it did perform well, I would only try it out on a limited basis just because of how new it is. Same story for any number of varieties or products.

Positioning varieties and technologies to be successful is key to your success as a grower. ThryvOn is a technology that we have talked about at length at grower meetings, and while it is extremely effective in reducing thrips injury, it does come with an added cost. Thus, to get the most bang for your buck out of that technology, I would advise growers to plant varieties with that technology when thrips are predicted to be worse. Same story with nematode varieties. They will shine on nematode ground, but you need to know if you have a nematode problem and which nematode you are dealing with prior to selecting a nematode variety (some varieties protect from root-knot nematodes only, while others protect from root-knot and reniform nematodes). These are just a couple of the things to take into consideration when selecting and placing a variety.

I hope that many of you saw the article I wrote for the Georgia Cotton Commission on the DNR Deer Management Plan Survey, but if you haven't it can be found here. The reason I mention that is because the deadline to provide public comment on the upcoming Deer Management Plan is midnight on April 5th. So please, constructively respond to that survey if you haven't already.

Last thing – in my ventures across the state this past winter, many growers approached me about the Peanut Team's podcast (All About the Pod) and mentioned we should do one for cotton. We are currently working on the first couple of episodes and they should be released soon, so stay tuned! They will be posted on the UGA Cotton Team Website (ugacotton.com) as well as distributed to our UGA County Extension Agents. If there is anything y'all would like discussed on the podcast please feel free to let us know.

As always, if you have any questions about these topics or anything else, please don't hesitate to reach out! Your local UGA County Extension Agent, myself, and the rest of the cotton team are here to help!

Important Dates:

Georgia Cotton Commission Mid-Year Meeting - Statesboro, GA – July 24, 2024
Southeast Research and Education Center Field Day – Midville, GA – August 7, 2024
Southwest Research and Education Center Field Day – Plains, GA – August 15, 2024
Cotton and Peanut Research Field Day – Tifton, GA – September 4, 2024
Georgia Cotton Commission Annual Meeting and UGA Cotton Production Workshop - Tifton, GA – January 29, 2025