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Lee County Ag Newsletter

First Week of May 2023, Volume 23, Number 1

THURSDAY, MAY 4, 2023

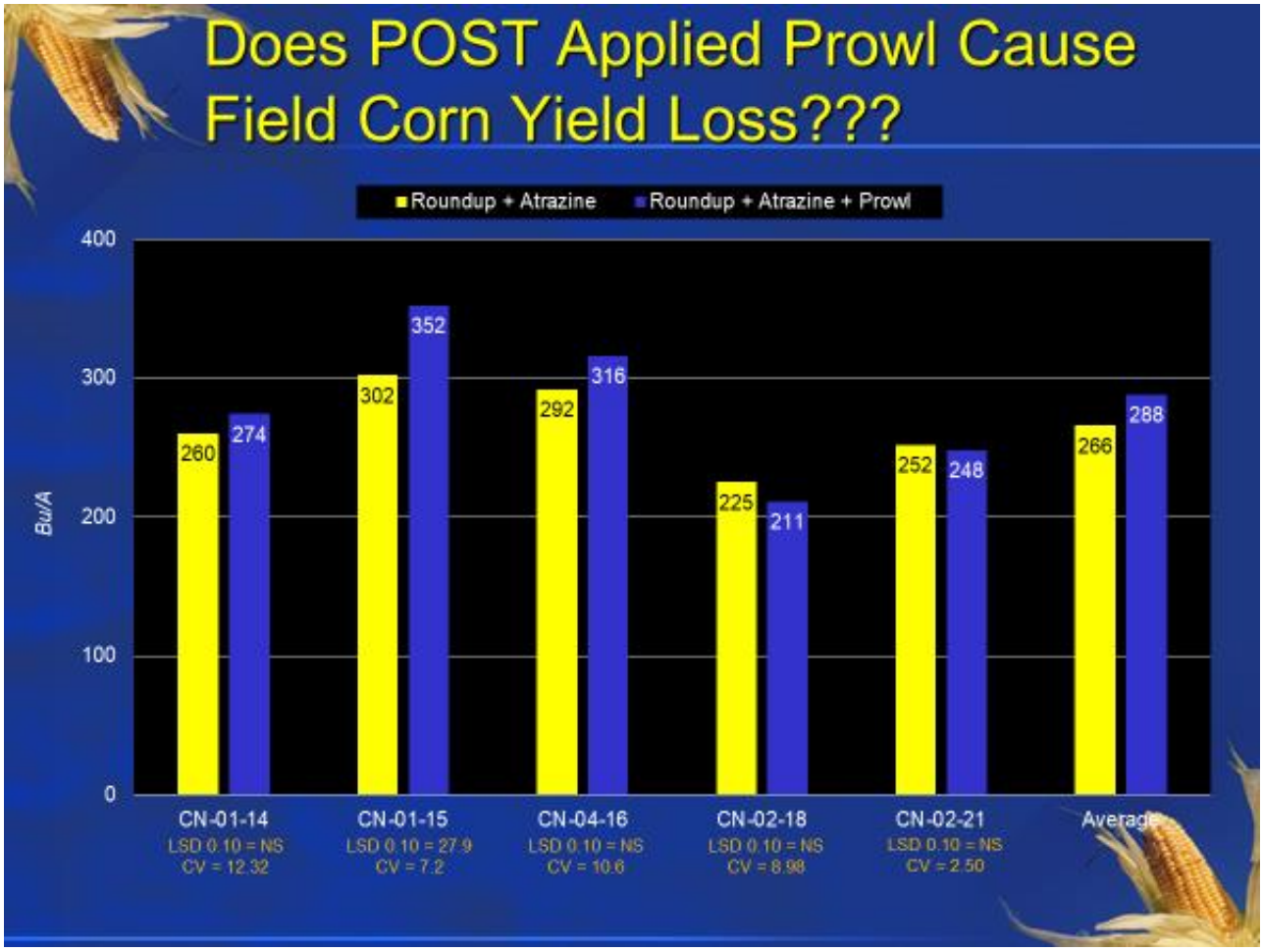
Field Corn Weed Control - 2023 (Prostko)

Question #1: Why do I have Prowl H20 3.8SC (pendimethalin) mixed with everything in these treatments?

Texas panicum/buffalograss/bullgrass is one of the most common annual grass weeds in Georgia field corn. Put very simply, Prowl provides the best residual control of Texas panicum. If growers are concerned about potential crop injury from Prowl, other residual annual grass control options include Anthem Maxx (pyroxasulfone + fluthiacet), Dual Magnum (*s*-metolachlor), Outlook (dimethenamid-*P*), Warrant (acetochlor), and Zidua (pyroxasulfone). Of these, Anthem Maxx and Zidua are slightly better on Texas panicum (*but neither are as good as Prowl*). FYI, Prowl should ***NEVER*** be applied PPI or PRE in Georgia field corn, only POST (labeled up to 30" tall/V8).

Question #2: I have heard that Prowl will cause root damage and yield loss when applied to field corn?

A long time ago in a galaxy far far away, Prowl was used as an EPOST (spiking) treatment in combination with atrazine. Back then, this was about the only way to get reasonable control of Texas panicum. In that scenario, root pruning was more likely to occur especially when corn was planted <1.5" deep and furrow closure was incomplete. Delaying Prowl applications allows the corn plant to develop a deeper root system (*but still a good idea to plant at least 1.5" deep and have complete furrow closure though*). For many years, I have been applying Prowl POST with various herbicides and have never observed any significant yield losses.



Posted by UGA Weed Science at Thursday, May 04, 2023

THURSDAY, APRIL 20, 2023

Week of April 17 - Questions and Answers (Prostko)

Here are some questions (*and my answers*) that I received this week from various county agents and other clients.

1) If Zidua 4.17SC (pyroxasulfone) is applied postemergence for the residual control of pigweed, annual grasses, and tropical spiderwort, what are the labeled stages of growth for application in field corn, soybean, and peanut?

field corn = spiking up to V8 (this is later than what is currently listed in the 2023 UGA Pest Control Handbook)

soybean = cracking up to V6 (Personally, I would prefer after the soybeans have fully emerged and are growing well)

peanut = cracking up to beginning pod development (R3)

2) How do non-Liberty (glufosinate) tolerant field corn hybrids respond to off-target movement of Liberty?

ASC and and I both think that drift rates are likely around 1/100X and lower. I do not have any local data from Georgia but check out the following information from LSU. These data suggest that Liberty rates ≤ 1/50X will cause less than 5% yield losses.

Here is a picture of Liberty injury on field corn.

3) Where can I get information about soybean variety tolerance to metribuzin?

The following table is listed in the 2023 UGA Pest Control Handbook (page 280):

SOYBEAN VARIETY TOLERANCE TO *METRIBUZIN* HERBICIDES

Soybean varieties that have exhibited acceptable tolerance to metribuzin herbicides (i.e. Boundary, Canopy, TriCor, etc.) based on multiple sources include the following:

GROUP IV	GROUP V	GROUP VI	GROUP VII	GROUP VIII
AgriGold G4190RX	AgriGold G5000RX	Asgrow AG64X8	AGS 758RR	Prichard RR
Asgrow AG47X6	AgriGold G5288RX	Asgrow AG6931	Asgrow AG7231	
Asgrow AG46X6	AGS 568RR	Asgrow AG69X0	Asgrow AG72XF0	
Asgrow AG48XFO	Asgrow AG55XFO	Asgrow AG69X6	Asgrow AG74X8	
GoSoy Leland	Asgrow AG56X8	Dyna-Gro S64LS95	Asgrow AG7535	
Pioneer P46A16R	Asgrow AG59X9	NC Dunphy	Benning	
Pioneer P46A35X	Hutcheson	Northrup King NK69-Q4XF	Dyna-Gro S72RS36	
Pioneer P46A57BX	Pioneer 95Y70	Pioneer P68A07SX	Northrup King NKS74-M3	
Pioneer P46A86X	Pioneer P51A61X	Vigoro V61N9	Northrup King NKS78-G6	
Pioneer P47A64X	Pioneer P52A05X		Pioneer P76T54R2	
Pioneer P48A99L	Pioneer P52A26R		Santee	
Pioneer P49A10S	Pioneer P55A49X		Southern Harvest 7418LL	
	Pioneer P55T81R		Stonewall	
	Pioneer P59A11SX		Vigoro V74N9	
			Woodruff	

Metribuzin herbicides are NOT recommended for use on sands or other coarse soils with less than 1% OM.

***METRIBUZIN* HERBICIDE SHOULD NOT BE USED ON THE FOLLOWING SOYBEAN VARIETIES:** AG4232; AG4835; AG48X9; AG49X6; AG51X8; AG53X9; AG55XFO; AG57XFO; AG5935; AG6130; AG6730; AG69XFO; AG75X6; AG7934; AGS LL5911; Dyna-Gro S61RY93; Pioneer P47T06X, P47T36R, P49T80R, P49T97R, P53A67X, P60T95X, P65A72X, P67T25R2.

For additional soybean cultivar/metribuzin tolerance information, check out the following from the University of Arkansas:

https://www.uaex.uada.edu/farm-ranch/crops-commercial-horticulture/soybean/2021-Metribuzin-Tolerance-of-Soybean-Varieties.pdf

When considering using metribuzin on soybean, cultivar tolerance is very important but there are other factors to consider as well including application rate, soil texture, OM, pH, and planting depth. Growers should read metribuzin labels very carefully prior to use. Here is a list of soybean herbicides than contain metribuzin.

Irrigation System Prep and Early Season Water Requirements for Peanut Production

- Wesley Porter, Extension Precision Ag and Irrigation Specialist, UGA
- David Hall, Extension Water Educator, UGA
- Jason Mallard, Extension Water Agent, UGA
- Phillip Edwards, Extension Water Agent, UGA

We are moving into the time when peanut planting is beginning, countless hours and many dollars have been spent on tillage, spraying and planting equipment to be prepared for another year. However, make sure that you do not overlook one of your largest investments and one that is just as important as any other, your irrigation systems. Now is an optimal time, if you have not already done so, to do routine and preventative maintenance on your irrigation systems to ensure they are in top shape. There are two important actions that need to be performed before you begin planting your peanuts. The first one is an overall irrigation system check and the second is specifically focusing on water application uniformity of your system. First look up the Spring Center Pivot and Lateral Irrigation System Preparation | UGA Cooperative Extension (B1452) and go through the checklist that includes all main components on your irrigation system to ensure that they are working properly. Some of these components can include but are not limited to the power unit, pumping system, pipes and drains, electrical systems (which includes cellular connections for remote monitoring and GPS), safeties, tires, gear box oil level and leaks, and the switches on the auto stop feature. Once you have checked all of these components, start the irrigation system and finish checking components by documenting any clogged or partially clogged nozzles along with any visible leaks. Also, check the line pressure, flow, sprinklers, end gun arc travel and booster pump operation. A reduction in pressure and GPM from last year or brass and excessive sand in the trap may be a good indication of potential well issues. An example of the system flowrate and application rate for a center-pivot irrigation system is represented in Figure 1. It is important to remember that due to increasing travel speed as we move towards the end of the pivot, the system flow rate (represented as dashed black line) will go up, but the application depth (represented as solid blue line) should remain consistent. This is achieved with properly sized sprinkler packages.

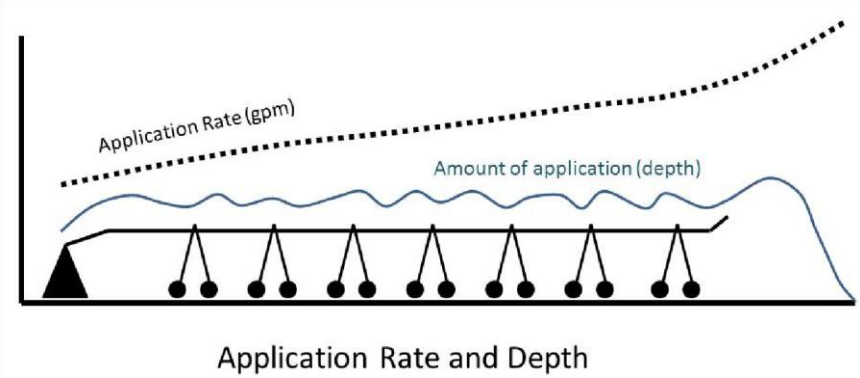


Figure 1. Application rate and depth across a pivot tower.

While it is easy to see major leaks, missing or clogged sprinklers 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, in conjunction with the extended forecast. Peanuts typically do not require a lot of water in the first month after planting as exhibited by the yellow box and water use curve below. However, if it gets hot and dry again you may need to apply a few small irrigation applications. The yellow box below represents the first five weeks after planting of peanut water requirements. Keep a track of rainfall and temperature, your irrigation efficiency (typically around 65-70% for high pressure systems and 80-90% for low pressure systems), and make irrigation applications accordingly. Keep in mind that the water requirement below is irrigation plus rainfall, and the weekly water requirement recommendation was developed based on a historical average of evapotranspiration. Thus, 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. An additional option is the utilization of USDA-ARS's Irrigator Pro, recent research (Table 1) has shown that the utilization of either sensors or Irrigator Pro maximize Irrigation Water Use Efficiency and yield when compared to other irrigation scheduling methods. For more information about either of these contact your local county Extension Agent.

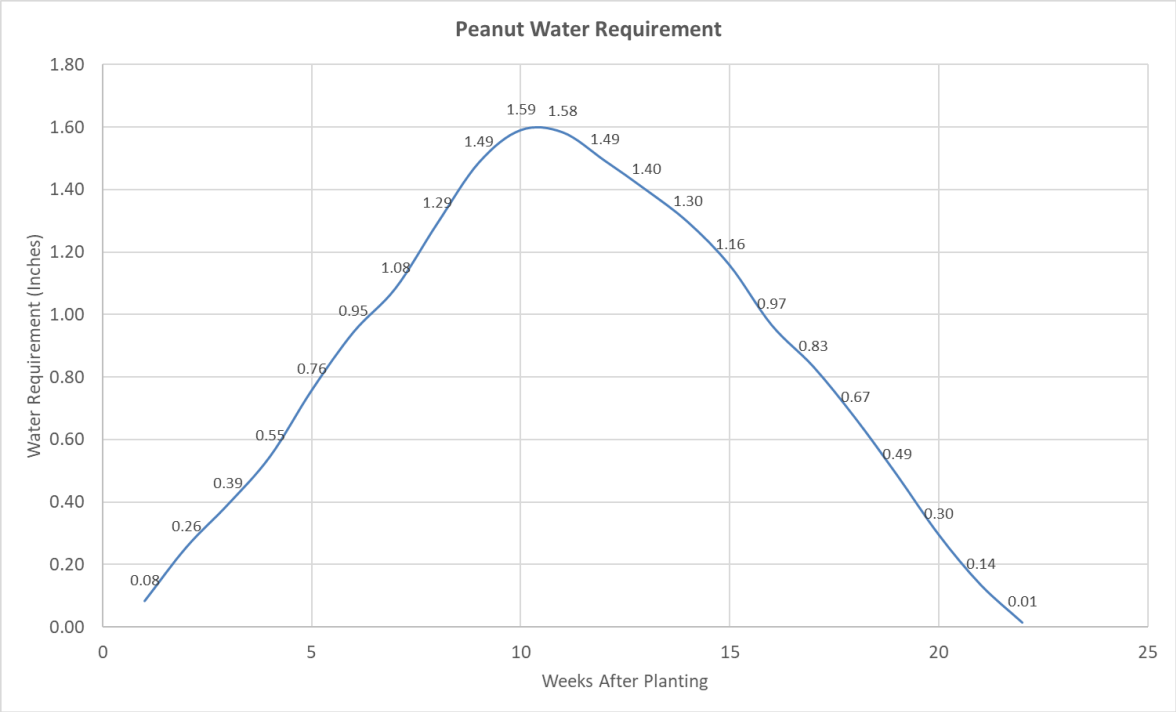


Figure 2. Seasonal Peanut Water Requirement.

UGA Extension's peanut irrigation checkbook, like for most crops, recommends very little water once the stand is established. Once the planters start rolling, farmers continue to plant as fast as possible 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 after an irrigation event to optimize the moisture. In doing this, careful consideration to the amount of water applied must be considered 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. If a rain event is not expected within 4-5 days of planting, another irrigation application will be necessary to incorporate and activate pre-emergent applied herbicides. Most labeled herbicides recommend around 0.5 inches of rainfall or irrigation. During extremely hot and dry weather, this post planting irrigation application can provide benefits in establishing a good start to peanut production; assisting with germination, activation of pre-emergent herbicides, keeping soil surface temperatures cooler and if soil surfaces have crusted, making it easier for peanut plants to break through for less vigorous seed. Having good soil moisture will help tremendously with keeping soil temperatures cooler and ultimately reducing the chances of aspergillus crown rot disease losses and other diseases in peanut plants.

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

Table 1. Results from Peanut Irrigation Scheduling Studies during 2017 and 2018.

Irrigation Scheduling Method	Irrigation Amount (in)	Total Water (in)	Yield (lb/ac)
2017 Rainfall: 24.30			
Dryland	1.00	25.30	**5875**
WaterMark (45 kPa)	2.85	27.15	**6396**
PeanutFARM	5.50	29.80	**5936**
Irrigator Pro	4.00	28.30	**6260**
50% Checkbook	6.75	31.05	**6262**
Checkbook	10.50	34.80	**5749**
EasyPan	4.75	29.05	**5979**
2018 Rainfall: 32.43			
Dryland	2.50	34.93	**5591**
WaterMark (45 kPa)	2.50	34.93	**5849**
Old Checkbook	7.80	40.18	**6204**
New Checkbook	6.70	39.13	**6147**
50% New Checkbook	4.00	36.45	**6231**
Irrigator Pro (Soil Temp)	6.30	38.68	**5996**
Irrigator Pro (Sensor)	3.30	35.68	**6433**
PeanutFARM	4.80	37.18	**5984**

Planter Preparation

- Simer Virk
- Wes Porter

While we are still few weeks out from planting peanuts, this is a perfect time for growers to check their planters and perform any required maintenance to ensure they are field-ready and dialed in for peak performance. While some of the planters are currently being or may have already been used to plant corn, it's important to note that some planter settings will need significant changes for peanut to ensure accurate metering and seed placement. Negligence towards proper planter setup can quickly become costly by resulting in inadequate stand establishment. A checklist is available here (Planter Checklist) to perform a thorough planter inspection. Here are few other considerations related to planter setup and in-field checks when getting the planter ready for planting peanuts:

1. **Seed depth** – Recommended seed depth for planting peanuts is 2.0 to 2.5 inches. Verify seed depth before planting both on a hard surface and in the field. Mechanical seed depth settings can vary among the row units on the same planter so take the time to check planted seed depth for each row unit and make necessary adjustments. This is important as even small deviations in the depth settings across the planter can result in large, actual planted seed depth variations in the field.

2. **Downforce** – Proper planter downforce is important to achieve target seeding depth so make sure the downforce system (whether utilizing mechanical or an active system) is set to apply adequate downforce on each row unit. A downforce of 100 to 200 lbs is generally considered adequate for planting peanuts in most of Georgia soil conditions. Remember these downforce requirements can vary with soil type, texture and moisture so adjust downforce settings as needed when moving from one field to another or within the same field if needed.

3. **Seeding Rate** – Recommended seeding rate for peanuts is 6 to 7 seed/ft, which is higher than the nominal seeding rates for corn and cotton (2 to 3 seed/ft), and requires the seed meter to meter seeds at a considerably higher speed (rpm) even at normal planting speeds (3.0 to 3.5 mph). Therefore, it is important to ensure that the seed meter is setup and functioning correctly to attain the desired seeding rate during planting. Unnecessary skips or multiples will result in poor or uneven stand establishment, which can further impact yield if stand is reduced significantly. Also, since peanut seeds are larger than corn and cotton seeds, they require a higher vacuum, thus adjust the vacuum appropriately for proper seed metering.

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 field conditions is critical for attaining adequate seed placement and proper seed-tosoil contact. Ensure that the double-disc openers are creating a true V-shape furrow, gauge wheels are running tightly (but not rubbing excessively) against the double-disc openers, and closing wheels are aligned perfectly behind the planter and set to apply adequate pressure on the furrow. Check for any misalignment of closing wheels and improper furrow formation when doing field checks and make necessary adjustments.

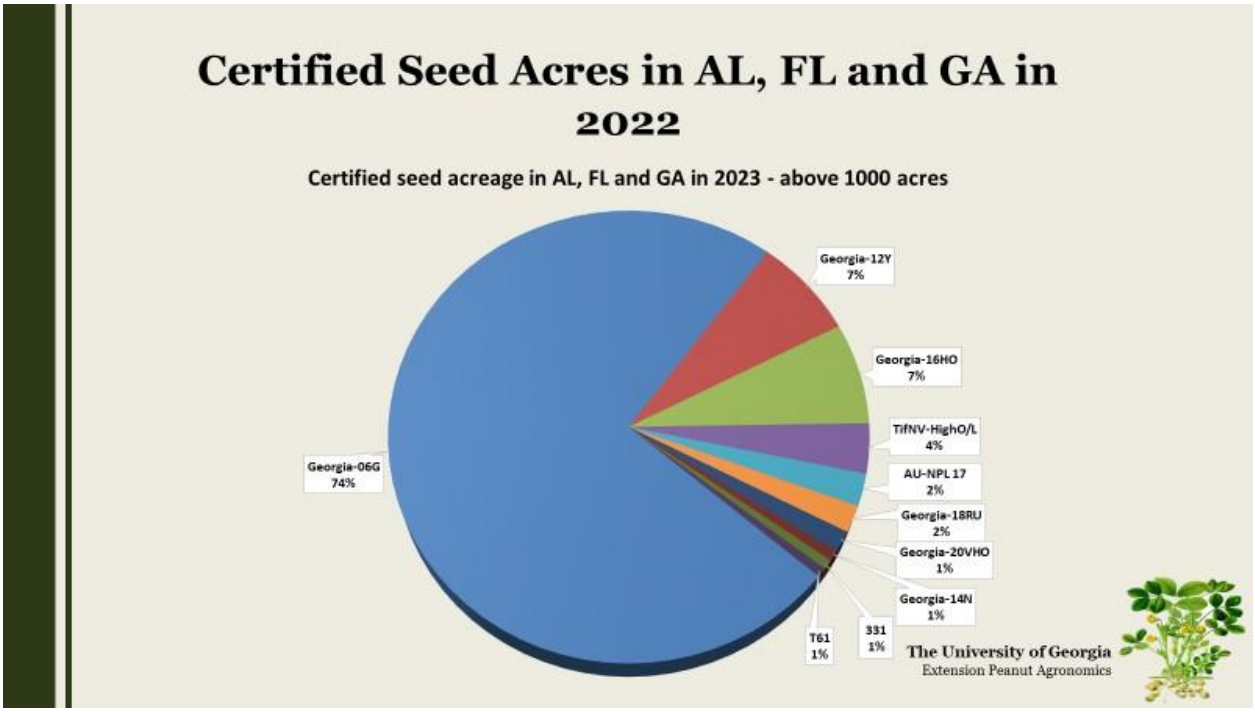
5. **Planting Technology** – Issues with planting technology during the planting season are common and can cost both significant time and money. Perform a thorough and timely inspection before planting to check the status and functioning of all technology components including GPS, seed monitor, wiring 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.

Peanut Pointers

- Scott Monfort

I have received several calls over the last few weeks regarding varieties. There a few key things to remember. First, a majority of the acres will still be GA-06G. Other varieties with some acres will be GA12Y, GA-16HO, GA-18RU, GA-20VHO, TifNV-High OL, AUNPL-17, & FloRun 331 (See figure below). There are seed increase acres out there this year for GA-21GR, TifNV-HG, and GA 22MPR. With this said, remind your growers that if they want to plant in April they need to look over the Peanut RX and do everything they can to minimize TSWV. There are only a couple of varieties with higher levels of resistance to TSWV compared to GA-06G: which includes GA-12Y and TifNV-High OL. We are hopeful the new varieties will provide some better resistance to TSWV. We will know more after this season. At this point all we can do is uses planting date, insecticide, row configuration, plant populations and tillage along with the current variety options available to minimize the impact of TSWV. I understand growers cannot adhere to all of the recommended cultural practices. We just want them to consider the recommendations and modify the practices as needed for their operation.

Along with these practices, growers also need to pay attention to seed quality and environmental conditions as they can affect final stand. The main thing of concern this year regarding seed quality is the potential reduction in seed vigor due to quality issues last year. Low seed vigor alone can cause slower plant emergence and/or skippy stands resulting in an increased risk of TSWV infection. However, if couple lower seed vigor, subpar environmental conditions, and planting in the high-risk window (AprilMay 10), you will have a prefect storm for having a high level of TSWV Infection and potentially a loss in yield potential.



Variety Information

• Georgia-12Y

- Plant before May 12
- Manage vines
- Manage Rhizoctonia Limb Rot

• Ga-18RU

- Higher susceptibility to TSWV compared to GA-06G
- Do not plant before May 10th
- Leafspot late in season can be an issue
- **GA-16HO**
- leafspot late in season can be an issue

• GA-20VHO

- High Risk to shed pods in prolonged periods of excessive moisture late in season, only plant in well-drained fields!

• TifNV-HG

- Root-knot resistant
- Similar to GA-06G in yield potential

• Ga-21GR and GA-22MPR

- These two varieties are new and we have little information available
- GA-21GR has potential for higher grades and medium to large seed size
- GA-22MPR is a high oleic RKN resistant variety and is medium to large seed size

Feel free to call if you have any questions: 229-392-5457 or mailto:smonfort@uga.edu.

Entomology

- Mark Abney

Georgia peanuts planted in April and prior to 10 May will be at increased risk for thrips infestation and infection by Tomato spotted wilt virus (TSWV). County agents are encouraged to review the Peanut Rx risk assessment tool <https://peanuts.caes.uga.edu/extension/peanut-rx.html> and be familiar with the factors growers can manipulate to reduce the risk of infection. There have been, and will continue to be, a lot of questions about thrips and TSWV management this year because of the high levels of the disease in our peanut crop in 2022. A few quick points:

1. The ONLY chemical that growers can apply to peanut that is proven to reduce the risk of TSWV is phorate (Thimet).
2. As odd as it seems, killing thrips does NOT reduce the risk of TSWV. Aldicarb (AgLogic), acephate (Orthene), and other products will kill thrips, but they do not reduce the risk of TSWV.
3. Killing thrips is a good thing to do, especially on early planted peanuts. Thrips feeding injury will reduce yield even if there is no TSWV.
4. The TSWV risk factors found in Peanut Rx are REAL. The validity of the risk index has been tested and proven again and again for more than two decades. If a grower is looking for a way to reduce the risk of TSWV infection, he or she should look no further than Peanut Rx. If it is not on Peanut Rx, it probably does not matter.
5. When the seed furrow is closed, opportunities for TSWV management are over. Growers should have a plan now for how they will approach thrips and TSWV.

I suspect there are a lot of people itching to put a seed in the ground…I certainly am. Thrips and TSWV management will be one of the most critical things growers do (or don't do) for their early planted peanuts. Hopefully we (re)learned some

valuable lessons in 2022: TSWV is not gone, TSWV robs yield and money, and we can reduce the incidence of TSWV infection through good management that starts with using Peanut Rx to understand risk.

Cover Crop Termination and Soil Moisture Retention

- R. Scott Tubbs

It is common to want to maximize spring growth of cover crops to get greater benefit of biomass production. This helps provide more nutrients or extend the amount of time that covers breakdown, and prolong the period of ground cover to get more weed suppression and soil moisture retention in the summer when the ground dries out rapidly. However, keep in mind that cover crops prevent the soil from warming rapidly in the spring. Also, while there are soil moisture retention benefits for the summer crop by having cover crop residue on the surface, an actively growing cover crop in the spring actually does the opposite and removes moisture from the soil profile ahead of planting the summer crop. Drying out the soil in the spring can delay planting, or if planting into dry (and potentially cooler) soil, emergence can be delayed or prevented if planted in a non-irrigated field. Roots from cover crops can also remove soil moisture from deeper in the soil profile, causing impedance to root penetration by the summer crop. Hence, some form of tillage (strip-tillage with a subsoil shank) is recommended in the Coastal Plains soils of South Georgia instead of strict no-till management when a cover crop is grown.

It is recommended to terminate cover crops in non-irrigated fields with ample time for rain events to replenish moisture through the soil profile before planting the summer crop. This is especially true for peanut, which has the largest seed of our four primary agronomic summer crops in the state, and thus has a relatively large water requirement to germinate uniformly. Non-uniform emergence, especially coupled with early planting, is a recipe for increased risk to Tomato spotted wilt virus (TSWV). It is typically recommended that cover crops are terminated at least 3-4 weeks prior to planting the summer crop. If there are cover crops in a field that were not terminated prior to April 1, and the field does not have irrigation to quickly resupply the soil moisture, then it is not recommended to plant peanut earlier than May 1 in that field. This will give ample time to catch some rain events, and move beyond the highrisk window for thrips and TSWV incidence.

Rotational Acreage for Peanut Going into 2023

- R. Scott Tubbs

The UGA Extension recommendation for rotation with peanut is to plant peanut no less than every 3 years in the same field. When planted in shorter rotation, yields decline and pest incidences (especially disease, nematode, weed, and insect) are more problematic and harder to control. Less ability to use pesticide modes of action that are not available in peanut but available in other crops also puts more pressure on the long-term viability of these products since resistance is more likely to occur. Thus, rotation is key to the future of agronomic cropping systems in Georgia for maintaining national production needs through above-average yields and reduced pest risk.

The primary rotation partners for peanut are cotton and corn. Soybean is not a good rotation partner for peanut because of similar pests that affect both crops. Yield decline has been observed when peanut is in short rotation with soybean compared to cotton and/or corn. Therefore, from an acreage availability standpoint, rotational acreage for peanut should be a consideration of the total of cotton + corn acreage compared to the total of peanut + soybean acreage. In 2022, peanut + soybean planted acreage totaled 850,000 acres, while cotton + corn totaled 1,715,000 acres. This would mean a statewide 3-yr rotation would be possible for peanut, if peanut were to follow all acres of cotton and corn. However, some cotton and corn are planted in northern parts of the state where peanut is not grown, meaning a 3-yr rotation is not sustainable in the

peanut growing areas of the state based on the 2022 acreage report. In addition, in 2020 and 2021, the combined peanut + soybean planted acreage in Georgia was substantially more than half of the combined cotton + corn acreage, meaning that a 3-yr rotation is not sustainable for peanut in the state, with greater pressure mounting on the entire production system over three consecutive crop seasons.

With the loss of some pesticide chemistries in peanut in recent years due to environmental or efficacy concerns, registrations, and/or other regulations, coupled with very few new ones being registered/approved for use on peanut, rotation and cultural practices will be increasingly important in continuing competitive production. Growers are encouraged to stick to recommended rotations for the viability of the entire production system in the long-term.

Nutrient Requirements in Cotton (*Henry Sintim and Glen Harris*): Adequate and balanced supply of nutrients is necessary to optimize the productivity of cotton, just as any other crop [1,2]. Without the right balance and amount of nutrients, plant growth would be impaired, significantly reducing yield and quality, or even leading to crop failure under severe nutrient stress. Plants require primary nutrients in greater amounts, followed by secondary nutrients, and then micronutrients. The relative amounts of the essential nutrients required for plant growth are, however, not indicative of their relative importance. The relationship between micronutrient deficiency and yield is just as important as that between macronutrients and yield. The concept is best illustrated by 'The Law of the Minimum', which indicates that growth is dictated not by the total resources available, but by the scarcest resource (limiting factor). In other words, growth occurs at the rate permitted by the most limiting factor.

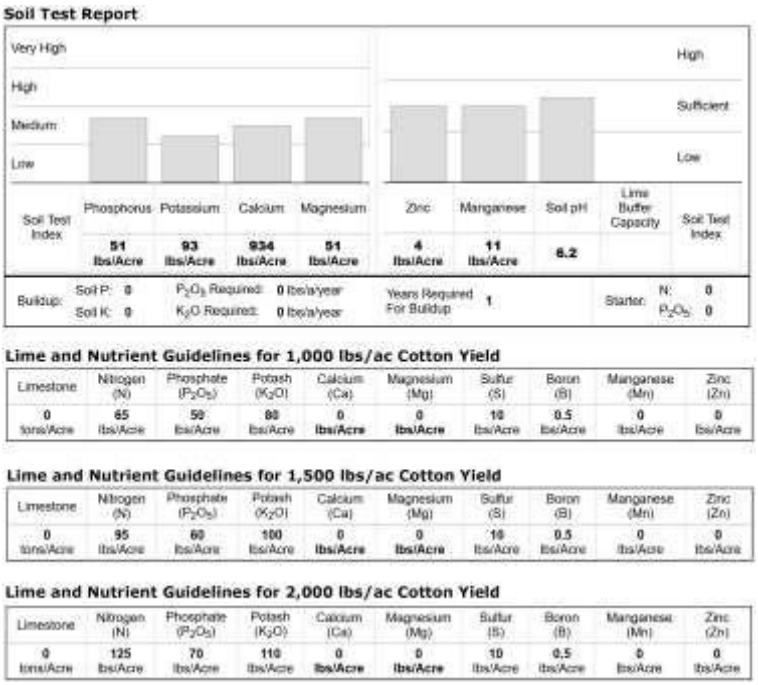
Soil testing is a valuable technique to know the nutrient levels in the soil and to determine nutrient recommendations. The University of Georgia Extension fertilizer recommendations for cotton are based on yield goals. Nutrient uptake by cotton varies substantially by yield, as depicted in Table 1, which compares the nutrient uptake of cotton at different yield levels. As can be seen, increasing the yield from 892 lbs/ac to 1,606 lbs/ac (80% yield increment) led to a corresponding increase in the uptake of all the nutrients that were assessed, with calcium being the only nutrient that did not increase at a greater level than the yield increase. A similar trend in the nutrient uptake dynamics was observed when the cotton yield increased from 892 lbs/ac to 2,141 lbs/ac.

Nutrient recommendations for greater cotton yields in the state are by adjusting the nitrogen, phosphorus, and potassium levels. Figure 1 shows the soil test report of a soil sample collected in Tifton, and the nutrient recommendations for different yield goals. These recommendations are based on maximizing the return on investment of fertilizer application, and

not just by obtaining high yield. With several cotton fields in Georgia having a history of poultry litter application, it is expected that they will replenish the soils with micronutrients, which are required in smaller amounts. Also, several Georgia soils have kaolinite as the dominant clay mineral, and they are dominated by oxides of iron. Thus, iron is less likely to be limited under the low soil pH conditions prevalent in the state. It is important to note, however, that plant nutrient uptake is regulated by several abiotic and biotic factors. The availability of nutrients in the soil does not guarantee they will be taken up by the crop [4]. Thus, complementing soil test with in-season plant tissue analyses can be an effective way to monitor the nutritional health of crops, and to inform timely nutrient management [4–6]. Figure 2 shows the recommended nutrient sufficiency ranges for plant tissue analyses for cotton.

Table 1: Comparison of nutrient uptake in cotton at different yield levels (892 vs. 1,606 lbs/ac yield and 892 vs. 2,141 lbs/ac yield). Adapted from Rochester [3], which was based on a six year-study in Australia.

Nutrients	**Nutrient uptake (lbs/ac)**		
	892 lbs/ac yield	**1,606 lbs/ac yield**	**Increment (%)**
Nitrogen	56.2	156	178
Phosphorus	11.6	24.1	108
Potassium	68.7	149	117
Sulfur	8.9	34.8	290
Calcium	63.3	83.9	32
Magnesium	14.3	32.1	125
Iron	0.20	0.73	261
Manganese	0.14	0.32	134
Boron	0.07	0.29	327
Copper	0.02	0.05	108
Zinc	0.05	0.11	105
	892 lbs/ac yield	**2,141 lbs/ac yield**	**Increment (%)**
Nitrogen	56.2	259	360
Phosphorus	11.6	36.6	215
Potassium	68.7	223	225
Sulfur	8.9	55.3	520
Calcium	63.3	138	118
Magnesium	14.3	56.2	294
Iron	0.20	1.45	614
Manganese	0.14	0.58	331
Boron	0.07	0.50	647
Copper	0.02	0.07	224
Zinc	0.05	0.18	250



Soil Test Report

Very High
High
Medium
Low

High
Sufficient
Low

Soil Test Index	Phosphorus	Potassium	Calcium	Magnesium	Zinc	Manganese	Soil pH	Lime Buffer Capacity	Soil Test Index
	51 lbs/Acre	93 lbs/Acre	934 lbs/Acre	51 lbs/Acre	4 lbs/Acre	11 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 for 1,000 lbs/ac Cotton Yield

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	65 lbs/Acre	50 lbs/Acre	80 lbs/Acre	0 lbs/Acre	0 lbs/Acre	10 lbs/Acre	0.5 lbs/Acre	0 lbs/Acre	0 lbs/Acre

Lime and Nutrient Guidelines for 1,500 lbs/ac Cotton Yield

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	60 lbs/Acre	100 lbs/Acre	0 lbs/Acre	0 lbs/Acre	10 lbs/Acre	0.5 lbs/Acre	0 lbs/Acre	0 lbs/Acre

Lime and Nutrient Guidelines for 2,000 lbs/ac Cotton Yield

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	125 lbs/Acre	70 lbs/Acre	110 lbs/Acre	0 lbs/Acre	0 lbs/Acre	10 lbs/Acre	0.5 lbs/Acre	0 lbs/Acre	0 lbs/Acre

Figure 1: Soil test report and lime and nutrient guidelines for 1,000; 1,500; 2,000 lbs/ac cotton lint yield following UGFERTEX, a University of Georgia Extension Windows-based online system for formulating prescription lime and nutrient guidelines for agronomic crops (https://aesl.ces.uga.edu/calculators/ugfertex/).

Plant Analysis Handbook – Agronomic Crops – Cotton

Plant Part and Time:	Upper mature leaves on vegetative stems prior to or at first bloom or when first squares appear.
Element and Sufficiency Range	**Interpretation and Recommendations**
Nitrogen (N) 3.50–4.50%	Deficiency due to inadequate N fertilization and/or ineffective N application. Poor root growth can result in N deficiency. Topdressing with 30 to 40 pounds N per acre may be sufficient to correct N deficiency. High N concentrations can result in excessive vegetative growth, making the plants more susceptible to insect injury. Follow nitrogen fertilizer recommendations to avoid both deficiencies and excesses. The nitrogen status of the crop can best be monitored through the petiole analysis program.
Phosphorus (P) 0.30–0.50%	Less than sufficient due to low soil P level and/or inadequate P fertilization. Low soil pH or restricted root growth may reduce P uptake. Soil test and follow the soil test recommendation. No corrective treatment is recommended for the sampled crop.
Potassium (K) 1.50–3.00%	Less than sufficient due to low soil K test level and/or inadequate K fertilization. Soil test and follow the soil test recommendation. No corrective treatment recommended for the sampled crop.
Calcium (Ca) 2.00–3.00%	Less than sufficient due to very low soil pH. Deficiencies may be induced by excessive K fertilization rates. Soil test and lime to adjust the soil pH to approximately 6.0.
Magnesium (Mg) 0.30–0.90%	Less than sufficient due to low soil pH (less than 5.4) and/or low soil test Mg level. If deficiency is detected, soil apply 25 pounds Mg per acre using a soluble source of Mg, or apply a foliar application at a rate of 0.30 to 0.40 pounds Mg per acre as magnesium sulfate in 20 to 25 gallons of water. Repeated applications may be necessary during the growing season. For succeeding crops soil test and apply limestone and fertilizer based on soil test recommendation.
Sulfur (S) 0.25–0.80%	Less than sufficient due to low soil S level. No corrective treatment is recommended for current crop, however, for future crops a minimum of 10 pounds S per acre should be included in the fertilizer program.
Manganese (Mn) 25–350 ppm	Deficiency not likely to occur in most Georgia soils. High Mn concentrations indicate low soil pH. If the Mg level in the leaf tissue is less than 0.30% and the Mn level greater than 350 ppm, liming with dolomitic limestone is essential to prevent Mg deficiency and a possible Mn toxicity.
Iron (Fe) 50–250 ppm	Deficiency not likely to occur. High Fe test results indicate soil or dust contamination. An accurate Fe determination can only be obtained with washed leaves.
Boron (B) 20–60 ppm	Low B is likely to occur on near neutral, deep sandy soils low in organic matter. If low B is detected apply a foliar application of B at the rate of 0.2 pounds B per acre in 20–25 gallons of water or in the insecticide spray. Multiple applications not to exceed 0.6 pounds B per acre can be made. For subsequent cotton crops boron should be included in the fertilizer program or insecticide spray program at the rate of 1/2 pound per acre. Boron deficiency may be intensified during droughty periods.
Copper (Cu) 5–25 ppm	Deficiency not likely to occur.
Zinc (Zn) 20–200 ppm	Deficiency may occur on near neutral, deep sandy soils low in organic matter. Soils recently limed may produce Zn deficient plants. Soil test and include Zn in the fertilizer treatment if the soil test is low and the soil pH is greater than 6.0. Deficiency symptoms will appear when the Zn level in the leaf tissue is less than 16 ppm. A foliar application of Zn will generally correct the deficiency, applying 1/2 pound Zn per acre, as zinc sulfate or 1/4 pound Zn per acre as zinc chelate.
Aluminum (Al) <200 ppm	High concentrations in the leaf tissue are primarily due to anaerobic conditions such as poor drainage or compacted soils. Acid subsoils or restricted root growth may cause high Al uptake. If both Fe and Al are high, probably due to soil and dust contamination, see Fe discussion above.

Figure 2: The University of Georgia Extension nutrient sufficiency ranges for plant tissue analyses for cotton. (https://aesl.ces.uga.edu/publications/plant/Cotton.html).

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Want to learn more about the H.SINTIM LAB visit **https://sintim.uga.edu/**

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Planting Considerations Following a Much Needed Rain (*Camp Hand*): As we enter full swing for cotton planting here in Georgia, I am very thankful we do not find ourselves where we were this time a year ago. The vast majority of the cotton producing regions of our state received measurable rainfall on April 27, with more forecasted in the coming days (I am writing this April 28 because we will be planting nearly every day next week). Rainfall accumulation across the state as recorded by the UGA Weather Monitoring Network is shown in Figure 1 below.

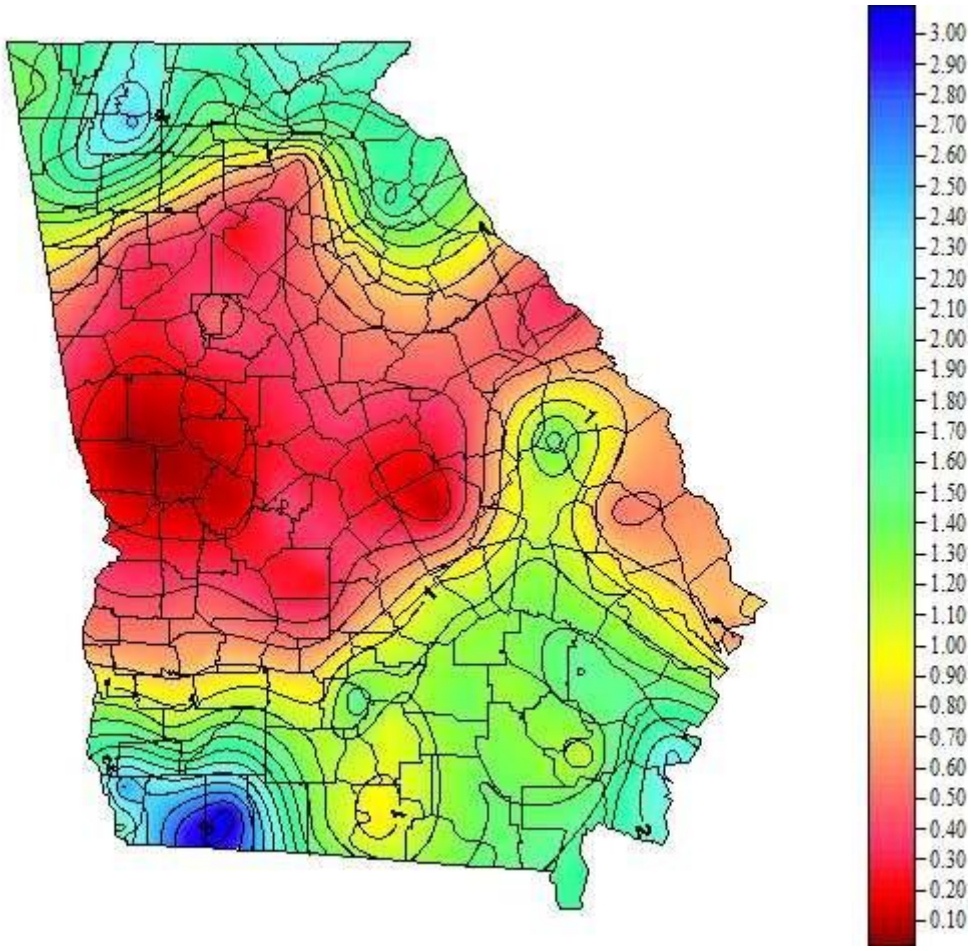


Figure 1. Rainfall across Georgia on April 27, 2023 (Data from the UGA Weather Monitoring Network).

This rain could not have come at a better time. Many are itching to begin planting, and this rainfall signifies a "green light" of sorts to get started. I spoke with someone a couple of weeks back and they asked what cotton growers in Georgia should be thinking about right now. In my opinion, what I would be thinking about right now is taking advantage of this moisture, particularly in dryland fields. We all know that May and early June tend to be dry in South Georgia, so this could be the last significant rainfall we see for a while. Although I believe that planting into adequate moisture might be the most important consideration for stand establishment right this second, there are a couple of other things to consider.

One great tool in deciding when to plant based on forecasted air temperatures is the North Carolina State University Cotton Planting Conditions Calculator. Utilizing this tool, you can look at forecasted 5-day DD-60 accumulation (based on air temperatures) in your individual fields by finding them on a map, and the calculator will tell you how the planting conditions are based on the 5-day DD-60 accumulation ranging from poor conditions (10 or fewer DD-60s in 5 days) to excellent conditions (45 or more DD-60s in 5 days). I use this tool frequently for deciding when to plant my early cotton (~April 1), particularly when I am trying to hit a marginal to adequate window to stress emerging cotton, and I find it extremely

useful in making planting decisions early in our planting window. However, from this point forward I believe the temperatures that are forecasted will show that planting conditions according to this model will be good to excellent for the vast majority of South Georgia. If you intend on planting cotton in the Northern parts of Georgia this tool can still be extremely helpful as temperatures begin to rise into May. As we all know, the weather forecast can change rapidly this time of year, so if you decide to use the planting conditions calculator, it wouldn't hurt to check in the morning and then again in the afternoon to make sure that predicted planting conditions have not been drastically altered by weather forecasts.

Another factor in stand establishment to consider is seed quality. This is a topic that myself and other cotton agronomists across the belt have dedicated a great deal of time to the last few years. In Georgia, we are extremely blessed to have a wide planting window, meaning that air and soil temperatures aren't our most limiting factor with respect to stand establishment (most of the time). However, in other parts of the cotton belt, producers must get their crop planted in a 10 to 14 day window because they will run out of time on the back end. Seed quality becomes extremely important with respect to a tight planting window, as growers will likely be planting into less than ideal conditions. However, this does not make Georgia growers immune from seed quality issues. The two major indicators of seed quality that seed companies measure are warm germination or standard germination tests, as well as cool germination. Warm or standard germination is typically indicative of how the seed will germinate in ideal planting conditions, while cool germination is more indicative of how the seed will germinate in less ideal conditions. Seed companies test for both of these measures and each seed lot is individually tested. Thus, if you intend on planting soon and would like these measures, they can be obtained from your local seed company representative.

If you have yet to make a decision on which variety to plant, UGA on-farm variety trial results for 2022 can be found here and Statewide Variety Testing results for 2022 can be found here. Please contact your local UGA County Extension Agent with any questions.

Although many factors affecting stand establishment have been discussed here, I want to reiterate that we should ALWAYS plant into good moisture – whether we are farming irrigated or dryland ground. Let's take advantage of what the good Lord has given us and roll on. Be safe out there, and as always, if you have questions please don't hesitate to reach out. Your local UGA County Extension Agent and members of the UGA Cotton Team are here to help!

UGA Weather Network and Stand Establishment in East Georgia Cotton (*Wade Parker*): This is my first submission to the monthly UGA Cotton Newsletter. I appreciate the opportunity to submit as I learn the ropes of this new position and figure out different means of information delivery. Please do not hesitate to call, text or email as we enter a new growing season. Look forward to working with you.

At the time of this submission, it is the first of week of May and with that comes the urge for growers to get started planting. Many in Georgia will plant peanuts first, with cotton not trailing far behind. To assist growers in making planting determinations, I encourage use of the UGA Weather Network. For Southeast

District, there are twelve locations evenly dispersed throughout our territory and many more on the border that could be relevant to your county.

Low air/soil temperatures and cotton seed germination can make getting a stand challenging. Early season cotton growth is accelerated when it is 86° F on the hi end and 60° F on the low end. Soil temperatures should be 65° F or higher with at least 50 growing degree days (DD60s) projected to be accumulated for the first five days. Upon looking at the UGA weather data from Midville (as I write this on April 28), the current soil temperatures are 60.5° F and 69.1° F at the two- and four-inch level respectively and the predicted air temperature hi is 81° F and low is 63° F. While not impossible to achieve a healthy growing stand of cotton, these conditions make it tougher as the chance of getting 50 DD60s in the foreseeable future is not as good. In fact, when the minimum and maximum temperatures for the next five days are entered into my DD60 spreadsheet calculator, the number is only 13 DD60s accumulated, which is well below the 50 needed. There is no DD60 predictor on the UGA Weather Network, but you can access past DD60s. For example, on April 27, there was only two DD60s earned. There are other variables to consider in the decision to plant or not plant including: potential for soil crusting, pest issues, rain forecast, waterlogging (especially with areas that were recently hit with strong storms) and even lack of moisture if applicable. Many of these variables can be dealt with through seeding rates, planting depth, and tillage as we shoot for a final stand of 1.5 plants per foot of row. These are just a few examples of how the UGA Weather Network can be used to help you and your growers make good planting decisions.

Early Season Staging of the Cotton Crop (*John Snider, Camp Hand, Josh Lee*): In the last cotton team newsletter, I discussed ways to simplify early season planting decisions, so growers can ensure that the seed they put in the ground gets out of the ground. Many other members of the cotton team provided valuable information for cotton producers in each of their respective areas of expertise. I perused last month's newsletter articles and found a wide variety of information addressing planting decisions, planter settings, minimizing drift, early season fertilizer and water applications, thrips management, silverleaf whitefly risk, nematodes and diseases, economics, and La Nina. The diversity of topics covered illustrated the complexities of managing a cotton crop, but as I tried to come away with a common theme that I could use as a basis for my article this month, it came to me. Timing matters!

In fact, timing matters probably more than any other factor I can think of when it comes to managing a cotton crop. For example, thrips management to prevent yield loss is especially important from planting to the four-leaf stage of plant development. Anything that can be done to control nematodes and seedling diseases must be done prior to closing the furrow. In the first month after planting, crop water use is extremely low because plants are small and have very little sun-exposed leaf area to transpire water, so irrigation events will be needed much less frequently than at later growth stages. The "Right Time" is one of the 4Rs of nutrient stewardship, where some nutrients are applied predominantly at planting, and others, like nitrogen, are applied in split applications, one at planting and one between the start of squaring and flowering. Herbicidal weed control, potential for crop injury, and potential to prevent weed-induced yield loss depend on crop growth stage. Therefore, it is important that we are all speaking the same language when talking about the growth stage of the cotton crop.

The emergence stage

Since we're so early in the growing season, let's start with the "Emergence" stage of crop development. A plant is considered emerged when the cotyledons have cleared the soil surface (no part of the cotyledons are touching the soil). Often, the term "germination" will be used interchangeably with "emergence", but emergence is the more correct term when talking about the number or density of plants with cotyledons above the soil surface.

What are the cotyledons?

The cotyledons are embryonic "seed leaves" that serve as food storage organs prior to emergence. During the germination process, the energy reserves of the cotyledons are raided by the embryo to drive pre-emergence growth of the seedling. After emergence, the cotyledons turn green and become photosynthetic machines that drive additional root and shoot growth for the developing seedling. Figure 1 is an image of a cotton field at the emergence stage of crop development with only the cotyledons showing above the soil surface. The cotyledons are not considered "true leaves" and can be distinguished from true leaves in two different ways. 1) The cotyledons are shaped liked kidney beans (or just kidneys if that makes things easier to remember). 2) There will be two cotyledons that occur directly opposite of one another. All true leaves that develop after the cotyledons will show up in an alternating pattern up the main stem.

Figure 1. Cotton cotyledons above the soil surface at the emergence stage of crop development.

The n^{th} leaf stage

I'm aware the "n^{th}" doesn't immediately mean much to anyone reading this newsletter, including me. However, everyone reading this has probably heard someone refer to cotton as being in the 1^{st} true leaf

stage, the 4-leaf stage, 6-leaf stage, etc. The "n^{th}" above simply refers to the number of true, mainstem leaves on a cotton plant. The n^{th} leaf designation is normally only used to refer to development in the early stages of growth prior to squaring because after squaring, the plant exhibits a complex branching pattern that would make characterization based on the number of true leaves unrealistic and uninformative. Figure 2 below shows a cotton crop in the 2-leaf stage of development that was planted back in mid-April. Note that we only count unfurled "true leaves" when staging cotton based on leaf number. The first true leaves will alternate up the main stem and will be somewhat heart shaped (envision a Valentine's day heart rather than a muscular, closed-circuit blood pump). Note that we ***do not*** count the cotyledons in the number of mainstem leaves. Once the cotton crop begins producing squares (floral buds), management considerations and the terminology used to define crop growth stage will change. I'll cover that in the June newsletter.

Figure 2. Cotton seedling in the two-leaf stage of crop development.

Weather and Climate Outlook (*Pam Knox*): While we had an early start to the growing season, it was followed by colder conditions in March that slowed things down quite a bit. Since that time, we have seen periods of very warm weather alternating with much cooler conditions. I know it's been frustrating for farmers as soil temperatures rise and fall, making it tough to know when to plant. Wet conditions have also been an issue in some areas.

The current cool weather is expected to stick around until early May, but after that the extended outlook shows a likely return to warmer than normal conditions for much of the growing season. We expect there will be occasional cooler periods, but the warmer conditions should help crops catch up on growing degree days and most should start developing at a more rapid pace than they are right now. The extended forecasts at the moment do not indicate any extended period of very dry conditions, so I am hopeful that we may escape a big drought this summer in spite of the warmer than normal temperatures.

The big player in the weather the rest of this growing season and next winter is the rapidly developing El Niño. El Niño is likely to be declared in the next few months. The odds currently put our chances of a strong El Niño by fall at 40%, with an almost 70% chance of at least a moderate El Niño and only a 10% chance of no El Niño at all. El Niño does not have a lot of impacts on Georgia in the summer months, but by fall it will start to impact conditions here in Georgia and surrounding areas.

The statistics and the longest-range climate models suggest that by November we could see typical rainy El Niño conditions occurring over southern GA and AL down into Florida as well as up the East Coast. Some models have wet conditions starting already in October. For farmers, this means that you will not necessarily be able to count on a dry fall for harvesting. David Zierden, the Florida State Climatologist, says that you may wish to plant varieties that will mature more quickly so you can harvest before the wet conditions really get entrenched later in the fall. If your crops are already in, then you will want to be watching the weather forecasts carefully this fall to take advantage of any dry windows that you can to get in the fields and take care of the harvest. This is probably not going to be a year where you can leave crops out in the field without taking a hit on quality and the ability to harvest late due to potentially wet weather and poor field conditions.

The other consideration for an El Niño is its impact on the Atlantic tropical season. Generally, when an El Niño is in place, the strong jet stream aloft makes it hard for tropical storms to organize and so we typically have fewer named storms in El Niño years. But that does not mean that we won't see any impacts. Remember, Hurricane Andrew developed at the end of an El Niño in 1992 and Hurricane Michael formed as the last El Niño episode was starting in fall 2018. It just depends where the storms go, and that is not predictable on a seasonal basis. Since the Gulf of Mexico has sea surface temperatures that are quite a bit warmer than normal for this time of year, I would not be surprised if we saw an early start to the tropical season with storms coming in from the Gulf. Some may develop quickly due to the warm water. Later in the summer and into fall, when El Niño is stronger, the number of storms in what is usually the most active part of the Atlantic tropical season might be lower than in past years.

Early Season Irrigation Requirements for Cotton Production (*Wesley Porter, David Hall, Jason Mallard, Phillip Edwards, and Daniel Lyon*): While every year brings different challenges, we must closely monitor the weather, soil moisture conditions, and future forecasts and make necessary adjustments. We have had dry conditions during most of April especially in southern Georgia; however, we did receive some significant rainfall during the last weekend of April. While, it can change, and you cannot put too much faith in a 10+ day forecast, currently the long-term forecast is for us to dry back out

after the first of May with less than a 30% chance of rain until mid-May. Currently, the temperatures are expected to remain in the 80's during the foreseeable forecast. However, in the recent years it has turned hot and dry during the month of May. Knowing this, we need to plan for planting into dry conditions and should plan to apply a small amount of irrigation prior to planting to initiate germination if possible in irrigated fields. It is also important to note that in order to receive the maximum benefits from recommended pre-emerge chemicals, another irrigation application should be planned. This of course is depending on expected weather. It has been documented that cotton seedlings receive less damage if the chemicals are incorporated with around 0.5 inch of water soon after the radical has formed but before emergence. This is a tight window so be prepared to be timely.

Most of the cotton across Georgia should be planted during early- to mid- May. Similar to peanut, cotton does not require very much irrigation during the first month or so of growth 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 in Figure 1. UGA Extension has developed an Irrigation Reference Guide for Corn, Cotton, Peanuts, and Soybeans | UGA Cooperative Extension, a quick and easy irrigation scheduling guide that is laminated and contains the four major row crops grown in Georgia. However, if it gets hot and dry again like it did during late May and early June of 2021 and 2022 you may need to apply a few small irrigation applications either weekly or potentially a few times per week. The red box below represents cotton water requirements the first five weeks 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 in the figure is irrigation plus rainfall, and the weekly water requirement recommendation was developed based on a historical average evapotranspiration. Thus, 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.

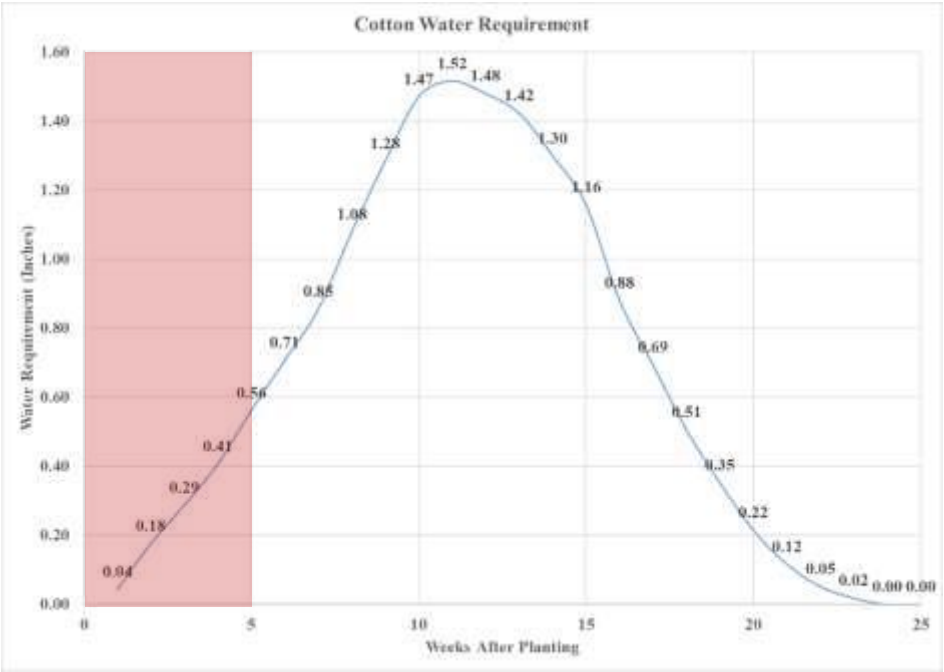


Figure 1. Seasonal Cotton Water Requirement.

For cotton farmers who utilize tools such as soil moisture sensors in their irrigation scheduling, there are a few quick reminders to keep in mind. We tend to visualize the above ground plant biomass and forget what is growing below the surface. We can sometimes be guilty of placing a sensor in the row of the cotton let it start logging data, making decisions from that data and assuming everything is good to go. Unfortunately, we need to ensure we know what is going on in the field before we blindly start following the sensor. Based on when you planted certain fields, cotton may be spread in age by several weeks while some is still in the bag, this is a good time to think about "weighting sensor depths" according to rooting depths.

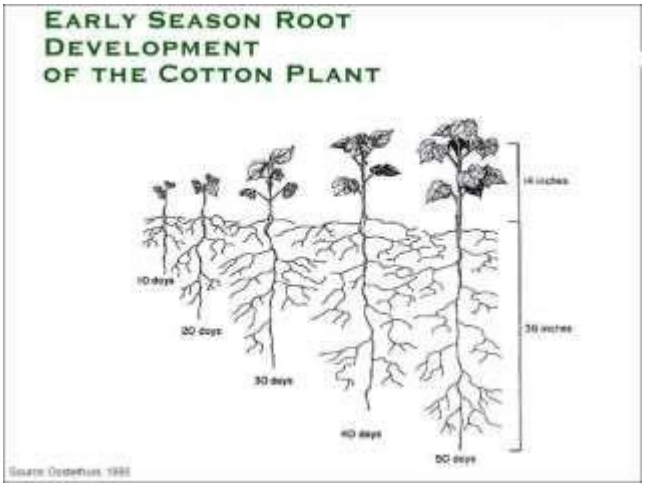


Figure 2. Visual development of root development as the cotton plant progresses in age.

Weather and available moisture are constant variables. Adding rooting depths and plant needs in the equation creates the need for a formula for weighting sensor depths in your irrigation scheduling decision, an important factor throughout the growing season. Most sensors come with two or three depths that measure available moisture. Early in the season, we generally have cool nights and afternoon temps are "normally" around the low to mid 80s. The evaporation rate is low in comparison to the dry hot summer days and nights. The root profile for the first month develops fairly shallow in the soil. These combinations of events reflect the plant water needs, as shown in our UGA Checkbook method. Moisture sensors generally default to an average of sensors available on the probe for a trigger decision. This can suggest we irrigate when it isn't needed for young cotton plants. For example, if a 16" depth is showing a dry reading and the 8" sensor is reading adequate moisture, the average will possibly trigger an irrigation event. If a cotton plant has just fully emerged and your root profile is in the 8"-10" range in this scenario, you actually do not need to irrigate. Now, considering the rooting depth let's weight the 8" sensor by an 80% value and the 16" sensor by 20%. Now since the average is weighted higher on the shallow sensor it can be seen that irrigation may not be needed. You should not begin to fully use deeper sensors for irrigation scheduling decisions until you see water use is occurring at those depths. Weighting moisture sensors can be very beneficial but can be harmful if adjustments are not made during the growing season. If you are interested in weighting sensors, below are UGA Extension suggestions to consider for weighting sensors during the growing season:

D1 = shallow sensor D2 = middle sensor D3 = deepest sensor

- Early-Season: 80% * D1, 20% * D2, 0% * D3
- Early-Mid Season: 60% * D1, 30% * D2, 10% * D3
- Mid-Season: 50% * D1, 25% * D2, 25% * D3
- Late-Season: 40% * D1, 30% * D2, 30% * D3

Soil moisture sensors provide the most accurate means of monitoring available soil moisture. Monitoring the root zone and available moisture present is a great tool in irrigation scheduling. If you have further questions about irrigation scheduling on your cotton, reach out to your local UGA County Extension Agent.

In-Field Planter Considerations (*Simer Virk and Wes Porter*): As cotton planting ramps up across the state this month, it is important to re-emphasize the value of proper planter setup and operation to attain a successful stand establishment. Last month's newsletter article on planter preparation covered key points on planter inspection and maintenance that could be performed before heading out to the field. While that provided a good opportunity to get the planter ready for planting, an important aspect of ensuring good planter performance in the field is regular checks and adjustments to different planter components as needed for the prevalent field conditions. Planter issues are common during planting but can be mostly avoided by paying attention to the planter operation and catching issues before or as they occur in the field. Here are few additional points to keep in mind while planting to minimize or prevent any potential planter related issues in the field:

- If you haven't taken the planter to the field yet, there is still time to **perform a thorough planter inspection** using the checklist available here Planter Checklist (UGA). Remember to take care of any major issues or parts that needs to be replaced before getting out in the field and start planting. Neglecting minor issues during initial inspection can result in greater downtime and/or major problems in the field.
- When you start planting cotton, make sure to **get out and dig behind the planter** to ensure that the desired seeding rate (seeds per foot), seed depth, and seed-to-soil contact are attained across every row. Seeding rate and/or depth variability is very common among the row-units on the same planter so checking each row is important to have a uniform stand across the field.
- Variability in planting conditions within the same field or among the fields is again common and will require **adjustment to planter settings based on the existing conditions**, with special consideration to variability in soil texture, moisture, and/or crop residue. A change in cotton variety, specifically seed size, would also require adjustments to vacuum and seed meter settings to ensure good seed singulation with minimal skips or doubles.
- When you notice any seed singulation, spacing, or depth issues in the field while planting, make sure to **properly identify and fix planter issues before continuing to plant** across the whole field with the same planter setup. It doesn't take long for small seed metering or spacing issues to translate into much bigger emergence problems later.
- Always keep a **consistent visual on important planting parameters** including vacuum pressure, row-unit bounce, operation of row-cleaners, gauge-wheels and closing wheels from the tractor cab during planting. Small planter issues – which can affect seed placement and emergence – during planting are often the hardest to catch and often go unnoticed until they become a problem.
- If using a seed monitor or any other advanced planting technology such electric seed meter drives or active downforce, **pay attention to the planting feedback for each row** instead of looking at the overall population and other averaged planting metrics. Planting issues are usually not consistent across the whole planter but more specific to individual row units so they are easy to identify and fix when viewing by-row feedback.

Early Season Nematode Update for 2023: Make Careful Decisions Before Closing the Furrow (*Bob Kemerait*): Whether one puts much importance on a "3-peat" of a warmer-than-average La Niña winter or not, the prudent thing for cotton growers to do now is to consider the threat from nematodes in 2023.

Already corn growers across the state have experienced the consequences of not using a nematicide;

cotton growers should be careful in their plans for effective nematode management.

The peak of cotton planting is upon us and cotton growers are reminded that careful decisions made now are critical to protecting the crop and yield potential for the rest of the season. Nematodes, especially root-

knot, reniform, and sting, can cause serious damage to a cotton crop. The best, and sometimes the only, management options are spent once the furrow is closed. Where root-knot and/or reniform nematodes are an issue, growers are reminded that they can plant nematode-resistant varieties. Planting resistant varieties will protect the plants from damage without the use of nematicides and will also help to reduce growth of nematode populations that will affect the cotton crop next season. Examples of nematode resistance cotton varieties for 2023 include DP 2141NR B3XF (root-knot and reniform resistance), PHY 443 W3FE (root-knot, reniform, bacterial blight resistance), PHY 411 W3FE (root-knot, reniform, and bacterial blight resistance), DG 3644 B3XF (root-knot and reniform resistance) and ST 5600 B2XF (root-knot nematode). There are also other varieties that have only resistance to root-knot nematodes.

Growers who choose not to plant nematode-resistant varieties, for whatever reason, are encouraged to use nematicides judiciously. No nematicide can provide season-long protection to the cotton crop and certainly will not any effect on nematode populations for next season. (Only planting resistant varieties or rotating away from cotton to a non-host crop will reduce populations for next season.) However, use of an appropriate nematicide at the appropriate rate will allow a cotton plant to get a "head start" and begin to develop a robust root system before the inevitable damage occurs. Protecting that young root system for 4 to 6 weeks early in the season can have lasting benefit on yield and profit.

Below are several key points to getting the most out your investment in use of a nematicide:

1. Know the type of nematodes and the size of the population in your fields. This is best accomplished with samples taken after harvest in the previous season. However, because of the generally warm winter of 2022-2023, soil samples taken now before planting may be helpful in the decision to plant a nematode resistant variety or to use a nematicide. Some nematodes, such as the ectoparasitic sting nematode, may be an easier target because they stay outside the root and are more exposed to the nematicide. Knowing the population size helps to determine which nematicide, fumigant (Telone II), granular (AgLogic 15G), liquid (Velum), or seed treatment (e.g. AVICTA, Copeo, BIOst, or Trunemco) is likely to best provide the needed protection to the cotton crop.

2. Averland FC nematicide (active ingredient abamectin) is a new product for 2023. As there is very little data available for the efficacy of Averland at this time, growers should use caution before whole-scale replacement of products that have proven effective in the past. UGA Extension will have additional data on Averland FC after the 2023 season.

3. Once the furrow is closed, the only additional option for nematode management available to growers in a foliar application of oxamyl (Vydate-CLV or ReTurn XL) at about the 5th true leaf stage to possibly extend the protective window of nematicides applied at panting.

4. As noted above, nematode problems for corn growers have been widespread again in 2023. I suspect that the combination of a warmer "La Niña" winter coupled with corn-behind-corn has led to such problems. Cotton growers should also anticipate increased problems with nematodes in 2023 for similar reasons.

5. Getting the most out of a nematicide requires using the right product at the right rate. It also requires consideration for environmental conditions as well. For example, fumigation with Telone II is affected by soils that are too wet or too dry at time of application and by significant rain events after fumigation. Likewise, granular products such as AgLogic 15G require some soil moisture to be activated and also taken up into the roots.

Though the 2023 cotton season is in its infancy, protecting a cotton crop against nematodes now will have lasting benefit throughout the season. Growers are encouraged to make the best management decisions now.

Supplemental Control of Thrips with Foliar Insecticides (*Phillip Roberts*): Thrips infest near 100 percent of Georgia cotton each year. At-plant insecticides which are recommended as a preventive treatment for thrips control provide a consistent yield response. At-plant treatments include aldicarb applied as granules infurrow, imidacloprid or acephate applied infurrow as a liquid, or neonicotinoid and/or acephate seed treatments. Infurrow treatments provide improved control and longer residual compared with seed treatments. ThryvOn is a new transgenic trait which greatly reduces thrips injury. Management of thrips in ThryvOn cotton will be covered in another section of this newsletter. Comments below pertain to thrips management in non-ThryvOn cottons.

Thrips begin infesting cotton as it emerges. Initially adult thrips feed on the underside of the cotyledons. Feeding injury is recognized by a silvery sheen on the bottom of the cotyledon. Adult thrips also deposit eggs in the cotyledon tissue. Thrips eggs will hatch in 5-6 days. Once the terminal forms thrips will move to and feed on unfurled leaves in the terminal. As these leaves unfurl, the characteristic crinkling and leaf malformation becomes obvious. Thrips injury is compounded by slow seedling growth. Therefore, if seedlings are stressed due to cool temperatures or herbicide injury, be sure you scout thrips and be timely with foliar sprays if needed.

Thrips infestations are generally higher on early planted cotton compared with later planted cotton. Historically we use May 10th as the line separating high risk and low risk. However, this date is a moving target from year to year. The Thrips Infestation Predictor for Cotton is a web-based tool which predicts thrips risk by location and planting date.

Scout thrips by randomly pulling plants at several locations and slapping the individual plants on a piece of paper to dislodge the thrips. Thrips will begin to move in a few seconds and count both adult and immature thrips. Adults thrips have wings and are generally brown to black in color. Immature thrips are cream colored and lack wings. The threshold for thrips is 2 to 3 thrips per plant with immatures present.

The presence of immature thrips is important as this indicates the at plant insecticide is no longer providing control. It is also important to observe true leaves, especially the newest leaf unfurling. If excessive damage is present you probably have lots of thrips. Seedlings in early stages of development (i.e. 1-2 leaf) are more sensitive to thrips feeding in terms of yield compared with 3-4 leaf cotton. If you have a thrips problem on 1-2 leaf cotton it is worth a special trip to control thrips! Once cotton reaches the 4-leaf stage and is growing rapidly, economic loss from thrips is rarely observed. Growing rapidly is important when making the decision to no longer worry about thrips. Orthene, Bidrin, and dimethoate are recommended for foliar treatment of thrips. When evaluating the performance of a foliar spray, remember that the next leaf to unfurl will still be damaged since thrips were feeding and damaging the unfurled in the terminal prior to the spray.

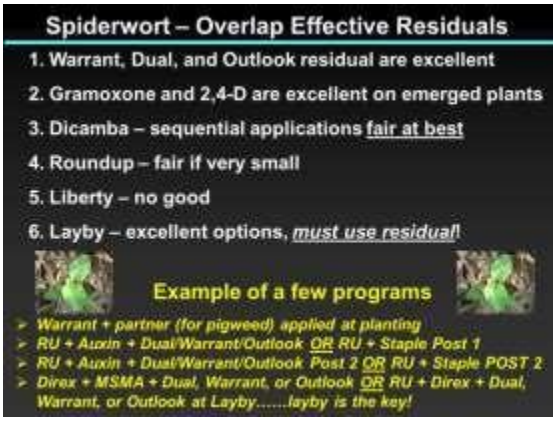
Thrips Management in ThryvOn Cotton (*Phillip Roberts*): ThryvOn is a new transgenic trait which significantly reduces thrips injury. We have conducted field trials with ThryvOn for several years and have never observed a planting which would benefit from a supplemental foliar insecticide. ThryvOn does not result in high levels of thrips mortality, however thrips feeding and egg laying are significantly reduced. Typically, we observe about a 50 percent reduction in actual thrips numbers when scouting and sometimes we observe populations exceeding the threshold in non-ThryvOn cotton. However, we rarely see significant plant injury even if very high thrips infestations are present. 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 and immature thrips are present**. Again, based on research in Georgia and across the Cotton Belt, we do not expect ThryvOn cottons to require supplemental foliar sprays for thrips. It is important that we do not confuse thrips injury with other confounding symptoms associated with herbicide injury or sand blasting. Dr. Scott Graham, Auburn Extension Entomologist, in cooperation with Extension Entomologists across the Southeast recently published Maximizing Insect Control in ThryvOn Cotton in the Southeast. This publication can be found here and covers both thrips and plant bug management in ThryvOn.

Carefully Manage Benghal Dayflower aka Tropical Spiderwort or Watch It Spread! (*Stanley Culpepper*): For three years in a row, tropical spiderwort has regained its status of being a major pest for many Georgia cotton farmers. The main reason for the weed to be on the move once again is likely due to the adoption of "weak" dicamba systems underutilizing effective residual herbicides and the lack of applying conventional chemistry as a layby directed spray. Interestingly for those who hate to slow down and take the time to run a layby rig or hooded sprayer through the field as cotton nears row closure, this weed along with morningglory has the potential to be your kryptonite.

Tropical spiderwort is a federally noxious, exotic weed that can spread quickly. Upon initial observation, tropical spiderwort appears to be a grass. While not a grass, it is a monocot (in contrast to broadleaf weeds, which are dicots) with leaves and stems usually fleshy and succulent. The stems will creep along the ground and root at the nodes. Vegetative cuttings from stems are capable of rooting and reestablishing following cultivation. Tropical spiderwort will produce seed above and below ground. As of last week,

spiderwort was present in some South Georgia fields and is expected to emerge more aggressively moving into early May with emergence potentially lasting through frost, even after cotton row closure.

To be successful, one must understand the importance of placing effective residual herbicides strategically throughout the growing season starting at planting. Numerous effective programs exist as long as one understands the concept of overlapping residual herbicides and is timely with those applications; a few program examples are provided in the figure below. *As always follow all herbicide label restrictions and reach out to your Extension Agent if you would like additional information.*



Important Dates:

Georgia Cotton Commission Mid-Year Meeting - Statesboro, GA – July 26, 2023
Southeast Research and Education Center Field Day – Midville, GA – August 9, 2023
Cotton and Peanut Research Field Day – Tifton, GA – September 6, 2023

Georgia Cotton Commission Annual Meeting and UGA Cotton Production Workshop - Tifton, GA – January 31, 2024

Summary of Low-Input Pecan Trial

Written by
Lenny Wells

‘Lakota’ pecan tree and crop with 0 fungicide sprays

For the last 5 years, we have been conducting a study on the performance of three low-input pecan cultivars—Lakota, Excel, and McMillan—at the UGA Ponder Farm near Tifton. As we have managed this particular orchard, low input in this case, refers to the absence of fungicide applications. The

trees received all other normal inputs with regard to fertilizer, irrigation, insect management, etc. but never received any fungicide sprays. I have written about this before and the trial has been featured at numerous field days but we have completed and published the work on these 3 cultivars. The results and the paper describing the 5-year study in detail can be found at the link below:

https://journals.ashs.org/horttech/view/journals/horttech/33/2/article-p247.xml

As I have discussed the advantages of improving the profitability of our pecan orchards in Georgia with cultivars that have higher yield potential and better disease resistance over hte past couple months, this is what I have based those comments on. 'Lakota' has proven it can perform unbelievably well in yield, quality, and disease resistance. However, you must manage the crop load of 'Lakota'. If you are wiling to do that, you can consistently keep yields in the 2000 lbs per acre range or higher. 'Excel' also performed well, with great yields and disease resisitance with no fungicides. We learned that 'McMillan, though disease resistant does not produce the quality nor the yields of 'Lakota', at least through the first 15-16 years.

We don't recommend growing even these highly resistant cultivars with no fungicide sprays. In this trial we were seeking maximum resistance at the present time. You should spray them 2-3 times through the season, but this will drastically reduce your cost of production, and along with the increased yields, you give yourself a buffer from low prices.

We will continue evaluating other cultivars in this trial as we now have 'Avalon' and 'Kanza' planted in the low input block.

Thoughts on 2023 Fungicide Schedules

Written by
Lenny Wells

Fungicide costs, like seemingly everything, have gone up a little this year. Some, like the tin products, have gone up dramatically. When I checked a couple weeks ago, Tin was at $120/gal. This may lead many growers to look for other options aside from Tin when the time comes. However, a word of caution on that. Tin offers great nut scab control when used in combination with Elast. But, you are getting more than just scab control out of using Tin in your program.

We currently have 7 classes of chemistry labeled for fungicide use in pecan (8 if you count tea-tree oil). We are still heavy on the group 3 materials because we often use at least 1 group 3 early in combination with a group 11 and we also use them later for nut scab as one of the components of Miravis Top or Miravis Prime. Using too many group 3 materials is dangerous because resistance (or at least insensitivity) has developed quickly in the past to some group 3's like propiconazole and tebuconazole in places when used too often. That doesn't necessarily mean the same will occur with difenconazole or mefentrifluconazole, but the history of the class of chemistry should be considered. This is why I am hesitant to replace Tin with another group 3 spray in the program when we are already using 3 or 4 group 3 sprays in the season. It could be done but you need to be careful.

Preservation of our fungicide chemistry is of paramaount importance and along with efficacy should be your top consideration when designing your fungicide program. In short, a combo spray of 25 oz Elast and 6 oz Tin is still only around $15/acre, which is a couple dollars more than the average fungicide spray cost this year but I feel the rotational value is worth that. Many do not like using the lowest labeled rate for fear of resistance development and loss of efficacy. When used alone I would agree but application as a tank mix -especially when rotating with other fungicide classes around it - is an effective method of preserving efficacy. Yes, there are places (ex. Albany area) where the 25 oz and 6 oz rates have become questionable over the years because of repeated consecutive use with these materials and if you have an orchard with a history of Tin insensitivity, then you may not want to use the 6 oz rate, but for most areas where the chemistry has not been abused in the past, the 25 oz Elast + 6 oz Tin rates still work well in combination when rotated with Miravis Top for nut scab sprays and are probably less of a risk long -term than rotating in another group 3 in that spot. If you don't feel comfortable with the 25 +6 oz combo of Elast and Tin, then a full rate (48 oz) of Elast may be a better option in that spot but it will be around $18/acre.

All that being said, the fungicide schedule we suggested last year works well and I see no reason to change it. You can find that here.

A common question at the moment is "should I use 50 GPA or 100 GPA"? 100 GPA has been the standard for a long time but Dr. Clive Bock with USDA in Byron has being doing some exceptional work in this area and has several years of compelling data to support using 50 GPA. From what I can see, it really comes down to coverage. For the heights your sprayer can reach, 50 GPA works great. Your droplets are more concentrated and, as always, where you get good coverage you get good efficacy. For hedged trees and trees 40′ or less, it is a no brainer that 50 GPA is a good way to go. The argument can be made that above that height you need 100 GPA but honestly, above that height you are not getting very good coverage with 100 GPA either, so does it make much difference? Maybe not, but honestly, I'm not quite ready to go there just yet on big trees aorund 60′ tall. But, we've got to look for creative ways to save some money growing pecans, and the 50 GPA application volume may offer a tool to chip away at that cost of production.

A Few Things To Remember-Fertigation, Ambrosia Beetles, and GACCP Vote

Written by
Lenny Wells

N-Fertilizer Injection

We are in the middle of fertilization season again and many are choosing to inject their N through the irrigation system. This is a great way to fertilize pecan trees with N. It's cheaper and allows you to spoon feed them a little at the time through the season. The trees respond well to this method of fertilization and you don't lose as much N when applied this way. In reference to my point about being cheaper—its cheaper and more efficient only if you are applying your N based on the treated area. When I was getting prices a month ago, dry urea was $0.55/unit and 28% liquid UAN was

$0.79 per unit. But when you inject through a microsprinkler system you are covering only a small fraction of the orchard.

As an example, if you have a 100 acre orchard spaced 40 X 40 (27 trees per acre) that's 2700 trees total. If you have a 360 degree microsprinkler tip that sprays a circle 19′ in diameter, you figure the area of that circle and multiply by the 2700 trees in the orchard:

$A=3.14(r^2)$——(I can't find the symbol for pi on the keyboard through the program in which I'm writing this)

$r=19/2 = 9.5$

$9.5^2 = 90.25$

$A=3.14(90.25)= 283$ square feet

283 X 2700 = 765,139.5 square feet total

765,138.5/43,560 = 17.5 acres

So in our example, if you are injecting 25 units of N/acre at the time on 17.5 acres, that's 437.5 units of N X $0.79/unit = $345.63 total per injection.

Let's say you do a total per year of 125 units/acre, so at 5 injections over the course of the year, that's a total of $1728.15 spent on N fertilizer.

A lot of people figure the entire orchard area when they are injecting and thus over-estimate and over-apply what they actually need. Your fertilizer dealer will like this but its not helping your pocketbook or your production. If you compare our example above with injecting based on total orchard area, you are looking at 25 units N/acre X 100 acres per injection, 2500 units total X $0.79 per unit = $1975 per injection X 5 injections = $9875 spent on N fertilizer. That's a big difference and the results on the tree will be the same as if you figured on 17.5 acres.

The exact numbers for drip may vary and depend on the spreading pattern in various soils as well as the number and volumes of emitters per tree but the formula above for microsprinkler could serve as a rough estimate.

If you are applying dry urea at $0.55/unit to the entire 100 acres, that's $0.55X 125 units = $68.75 X 100 = $6875 spent on N fertilizer. If you only apply that to your herbicide strip, which covers about 30% of the orchard floor, that's $2062.50 spent on N fertilizer. Again, a big difference with the same results on tree N and yield.

Be On the Lookout For Ambrosia Beetle

Over the last week there have been a number of calls on ambrosia beetles. As temperatures continue to warm up there is potential to see more activity so be on the lookout for these pests on young plantings (1-3 years old) especially. A pyrethroid spray every 7-10 days remains the best method of managing this pest where problems occur.

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