

Articles in this month's issue include:

1. Thoughts following the "H-word" (*Camp Hand*)
2. Another Storm to Weather (*Wade Parker*)
3. Cotton IPM Update (*Phillip Roberts*)
4. Cotton Irrigation Considerations for August (*David Hall, Jason Mallard, Phillip Edwards, Daniel Lyon, and Wesley Porter*)
5. Physiological Maturity in Cotton - Cutout (*Josh Lee, John Snider, and Camp Hand*)
6. Cotton Leaves Tell Stories of Disease, Nutrient Deficiencies, and Nematodes in August (*Bob Kemerait*)

Thoughts following the "H-word" (*Camp Hand*): Unfortunately, it seems like the "H-word" is a thing cotton producers in Georgia have become accustomed to dealing with. Hurricane Debby has moved across the southern part of Georgia, and calls are beginning to trickle in on what we need to do following the storm. First and foremost, the predominant subject on the upcoming episode of the [Talkin' Cotton Podcast](#) was our thoughts on what to do coming out of this storm. Give it a listen if you haven't already.

Here are a few things I'd keep in mind:

1. In initial evaluations shortly following Hurricane Debby, exercise caution!!! Many roads are likely to be damaged where rainfall was excessive, trees will be downed, powerlines might be down, etc. Let's exercise caution and be safe while evaluating impacts to the crop.
2. Document everything!! Crop damage, structural damage, etc. The more pictures the better.
3. Let's not rush any management decisions!!!! It is likely that immediately after the storm, you will not like how your crop looks and will want to do something about it. Many will use this opportunity in an attempt to get growers to utilize unproven products, or utilizing products for a purpose in which they haven't been proven to work. For example, last year I began getting calls on the use of mepiquat chloride (Pix) after Hurricane Idalia made it's way through Georgia. It was being told to growers that spraying Pix on cotton that was blown over by the storm will help it stand back up... **Mepiquat chloride only shortens internode length on actively growing cotton!!!** If you have questions on management following this storm and want to run ideas/theories by your county agent, please reach out to them and we will try to help as much as possible.



4. Following heavy sustained wind and rainfall, you are likely to see something like the above picture in your fields. Before you start to panic, note a few things in this picture. First, there are only a few squares in this pile of stuff that would up in the edge of the field. The vast majority of this is bloom tags that have fallen off of bolls! Thus this picture is not “yield loss due to Debby” but just all the blooms being washed to the end of the field.

In response to the previous comment on yield losses due to Hurricane Debby, it is still very early to try and determine what the impacts of this storm will be on our cotton crop. The overcast days and rainfall will result in some fruit shed of bolls that are younger than 12 days old, particularly in cotton past the third week of bloom. If it is the third to fifth week of bloom and you see significant fruit shed in your fields in response to this storm, a couple of things to consider. First, the plant is shedding those fruit in

favor of supporting potential fruit later in the season. So, we may need to add a little plant growth regulator to those plants to discourage excessive vegetative growth following fruit shed, and we may need to push some of these fruit into September. Remember, our last effective bloom date according to recent work is between the first and 15th of September, so we can push this crop to try and make up what was lost if you haven't already cutout. With some places getting in excess of 10" we will likely need a shot of foliar fertility to support those fruit in the top of the plant (10 lbs. potassium nitrate/acre) and continue to monitor for damage caused by true bugs in those top fruit. My main concern from this storm will be in the East part of the state that has received excessive rainfall and if we have cotton sitting in standing water for a long period of time. I'll be making a trip to that part of the state on Monday to spray some plots and intend to spend a good portion of the day riding and assessing the crop.

Lastly, although this storm will impact many acres in Georgia, I am still optimistic on our crop as a whole. We still have good potential and if the sun will come out and wind keep blowing, water may get off these fields quicker than anticipated and then it's a race to the finish. As always, if you have questions please don't hesitate to reach out to your local UGA County Extension Agent. They, along with the Cotton Team, are here to help!

Another Storm to Weather (Wade Parker): At the time of writing this submission, the rainfall from Tropical Storm Debby has intensified tremendously. As I think about the last ten years, it does seem our weather patterns have changed, as tropical storms and hurricanes have intensified in strength and frequency. With Tropical Storm Debby, it appears that Southeast and East Georgia are going to take the biggest hit. I am indeed concerned about the wind, but very concerned about the inundation of excessive rainfall.

The majority of the crop is in the 3rd or 4th week of bloom with continued boll development and boll set being full speed ahead. How a storm damages a crop can be attested at what stage the crop is in, which is why I prefaced this paragraph with the first sentence. Two things come to my mind: excessive flooding in fields for a prolonged period and lodging/twisting plants from wind. The cotton plants must have an aerobic environment to survive. If the field or part of the field remain water logged for a prolonged period of time, then death can and will incur. When the supply of oxygen is cut off, then the plant could die in as little as 36 hours (*July 2013 UGA Cotton Newsletter*). I would say the 36 hours is under worse case soil conditions. Even if the plant doesn't die, many may turn chlorotic and experience yellowing of the leaves along with red stems. The biggest variable that will save or lead to a possible recovery is for a quick field drying out process and plenty of sunshine, which you have to have sunshine to get any kind of recovery and drying. From an agronomic standpoint, I think the natural reaction is to start feeding the plant with foliar products. Foliar products can play a role in recovery but must be done at the proper time and not immediately after the weather event. Many times photosynthesis is reduced during stress, thus preventing uptake of any soil or foliar applied nutrient product. I think any agronomic input decision should be on hold until an assessment of plant prognosis is completed.

Plant lodging and limb twisting can be an issue following a tropical storm. Usually, plants will stand back-up or make a true attempt to, if they are not completely flat or matted up. The time it takes for

sunshine to return will dictate the speed of this occurring, as the plants respond to the phototropic process. Even if the plants are still standing or leaning, many times the limbs will be twisted, which makes management very difficult, as ground equipment can do a lot of damage if used. The use of aerial equipment for field operations will rectify this, but this adds extra expense to the bottom line. It is worth mentioning that immature bolls touching wet ground can and will start rotting, as light is reduced and moisture is high from the saturated soil. There is nothing we can do about that.

From a financial management standpoint, growers should always contact their insurance agent in the event of a disaster. Even if the crop turns around and returns to normal, it costs only a phone call or email. Not doing so could slow the process when harvest arrives or the company possibly refusing the claim for non-reporting. Do not take for granted that everyone received damage and the insurance company should be aware the county got 14" of rain from Tropical Storm Debby. As the process unfolds several days after the storm, more than likely certain %'s of the field will be destroyed and certain %'s will need further management. Upon notification, the company will send an adjuster to the field(s) and the damage will be documented. The majority of the time, the crop has to be taken to harvest or an appraisal is performed at harvest to determine an indemnity payment. It gets really discouraging when the good parts of the field yield enough to meet the guarantee, and no payment is awarded. The information obtained from insurance will be helpful in assisting you and the grower in determining the fate of the crop. It would make sense to continue to farm the healthier and drier parts of the field from an agronomic standpoint, but we must weigh the financial piece too. A lot of variables to take into consideration!

Hopefully, the storm will move quicker than what is forecasted. As always, take everything on a case by case basis and think everything through.

Cotton IPM Update (Phillip Roberts): The boll feeding bug complex is typically the most common insect pests being treated in Georgia cotton during August and September. We typically think of stink bugs, but we must be reminded that other insect pests such as leaf-footed bugs as well as clouded and tarnished plant bugs may also feed on developing bolls. It is important that we are monitoring internal boll injury on 10-12 day old bolls, these bolls are about the diameter of a quarter and are the size on which stink bugs prefer to feed. Use the dynamic threshold based on internal boll injury and week of bloom to make treatment decisions. The threshold is decreased or increased based on the number of susceptible bolls per plant. Bolls are susceptible to yield loss from stink bugs until they are about 25 days old. The window when we typically have the greatest number of bolls present which are susceptible to stink bugs is the 3rd, 4th, and 5th weeks of bloom so our threshold is low during this time. It is also important that you are observant for boll feeding bugs when walking fields. Knowing what species are present will allow you to select the most appropriate insecticide.

Looking in blooms while walking fields is a good idea. Be observant for "dirty blooms" which suggest you may have plant bugs in the field. If you observe dirty blooms it would be a good idea to do drop cloth samples which is our best sampling method for immature plant bugs. We rarely talk about or think about corn earworm in recent years. Three-gene Bt cottons are great technologies, but they are not immune to corn earworms. In years past it was not uncommon to see corn earworm larvae in blooms. It is also

important that you check bolls with stuck bloom tags for corn earworm. We have concerns about corn earworm susceptibility to pyrethroids so if you have escapes we may need to use alternative chemistry if infestations are high.

Spider mites are also common across most of south Georgia. The threshold for mites is “apply when 50% of plants are symptomatic and populations are increasing”. So, what is a symptomatic plant? Spider mites are very small and feed on the underside of leaves, often in the folds of the leaf or near the base of the leaf where it is attached to the petiole. Early symptoms include yellow spots or stippling on the upper leaf surface, especially on the folds of the leaf. These early symptoms are what we should be scouting for. In time areas of leaves which are damaged will turn reddish and if populations are high and the mites are not controlled, damaged leaves may defoliate. When scouting it is important that you confirm the presence of live mites on damaged leaves which will require magnification with a hand lens. Severely damaged leaves (reddish symptoms) may no longer have mites so be sure to check leaves with mild symptoms of injury.

Silverleaf whitefly (SLWF) has been reported from many areas in south Georgia, the geographic area is larger than most years. Granted most of these infestations are low, but the presence of SLWF is important and should impact insecticide selection for other pests such as stink bugs. Conservation of beneficial insects is extremely important; only treat other pests when infestations exceed threshold and avoid insecticides prone to flare SLWF. Some fields have been treated for SLWF in the last 7-10 days. It is imperative that we are VERY TIMELY with insecticide applications when and if needed. At the end of the day, timeliness is money. How the remainder of the year goes with SLWF will depend on your management decisions and the weather. Poor decisions and hot, dry weather are favorable for SLWF populations. Many of you know that we monitor SLWF populations using yellow sticky cards in and around Tifton each week. These sticky cards or traps are placed in right of ways. We have recently launched a website, <https://stopwhitefly.org/monitoring/>, which illustrates weekly captures for the past five years. Below are two Extension publications with additional information on SLWF. The first provides detailed instructions on how to scout whiteflies and use thresholds. The second explains the biology of SLWF and describes environments which are at greatest risk of whitefly infestation.

1. Sampling and Managing Whiteflies in Georgia Cotton
<https://extension.uga.edu/publications/detail.html?number=C1184>
2. Cross-Commodity Management of Silverleaf Whitefly in Georgia
<https://extension.uga.edu/publications/detail.html?number=C1141>

Cotton Irrigation Considerations for August (David Hall, Jason Mallard, Phillip Edwards, Daniel Lyon, and Wesley Porter): This year the cotton crop across south Georgia seems similar to last year in that we have a wide range of fields across the board as far as production stage. This does make it difficult to answer questions on irrigation recommendations without the answers to the standard questions of when was your cotton planted, what stage is it at right now, how much rain have you gotten or missed, what is your estimated rooting depth, have you irrigated up to this point, how much, or when was the last application? This year, like all years has had its challenges as we have seen our fair share of planting delays due to some extended rainy periods and wet soils during the month of May and early June. Then

we had some very hot and dry weather over the months of June and early July and a majority of our crop should be in peak water usage now, if not moving on through it, as shown in Figure 1.

Even though perhaps peak water demand may be past if the crop was planted during late April or early May, it is critical not to fall behind on irrigation during bloom. It is critical that we continue to monitor the weather and make smart irrigation decisions. Even though water requirements in some fields may be starting to move out of the peak demand, don't get too comfortable, it's always difficult to catch up with irrigation alone. Over the next month, keeping up with the water requirements is very important. The water demand will be lowering as we move on into the season, but it is still critical to have adequate soil moisture during the entire period of bloom. Based on planting date, the weekly water requirement of the crop can range between about 1.0 to 1.5 inches per week based on the UGA Extension checkbook method for cotton. Please keep in mind the weather conditions and how much of an impact they can have on water requirements. In other words, the checkbook method is there to give you a reference as a guide, but this alone should not be used for the final decision. We are entering the tropical storm season and have opportunities for large rain events and even some hit or miss showers. Some days can be of intense heat with low humidity, leading to high evapotranspiration rates and cause the need for higher than recommended water requirements for that week. Conversely, we can receive hot days with very high humidity and overcast conditions which will mean the plant is still using water but the evapotranspiration rate is very low. Plus, with a good canopy closure the ground is well shaded. It's really amazing to see crop water use through moisture sensors. The graphical representations of plant water demand and environmental conditions can be an eye-opening experience to witness throughout a growing season. It's human nature at times to question sensor readings when it comes to irrigation scheduling. It's true that moisture sensors do not last forever and can fail to give accurate data. With most Watermark sensors, accuracy can be simply checked by attaching a meter to the individual sensor probe wires to verify the current readings. The old school method of drilling down with a 1-3-inch auger near the probe, monitoring soil moisture as you drill down, can assist to determine if the sensor is faulty, or giving erroneous readings. If you don't have access to moisture sensors, walking your fields with a shovel or soil probe to investigate available moisture is highly recommended. Again, the checkbook method is just one tool of many tools that can be used to assist in scheduling irrigation.

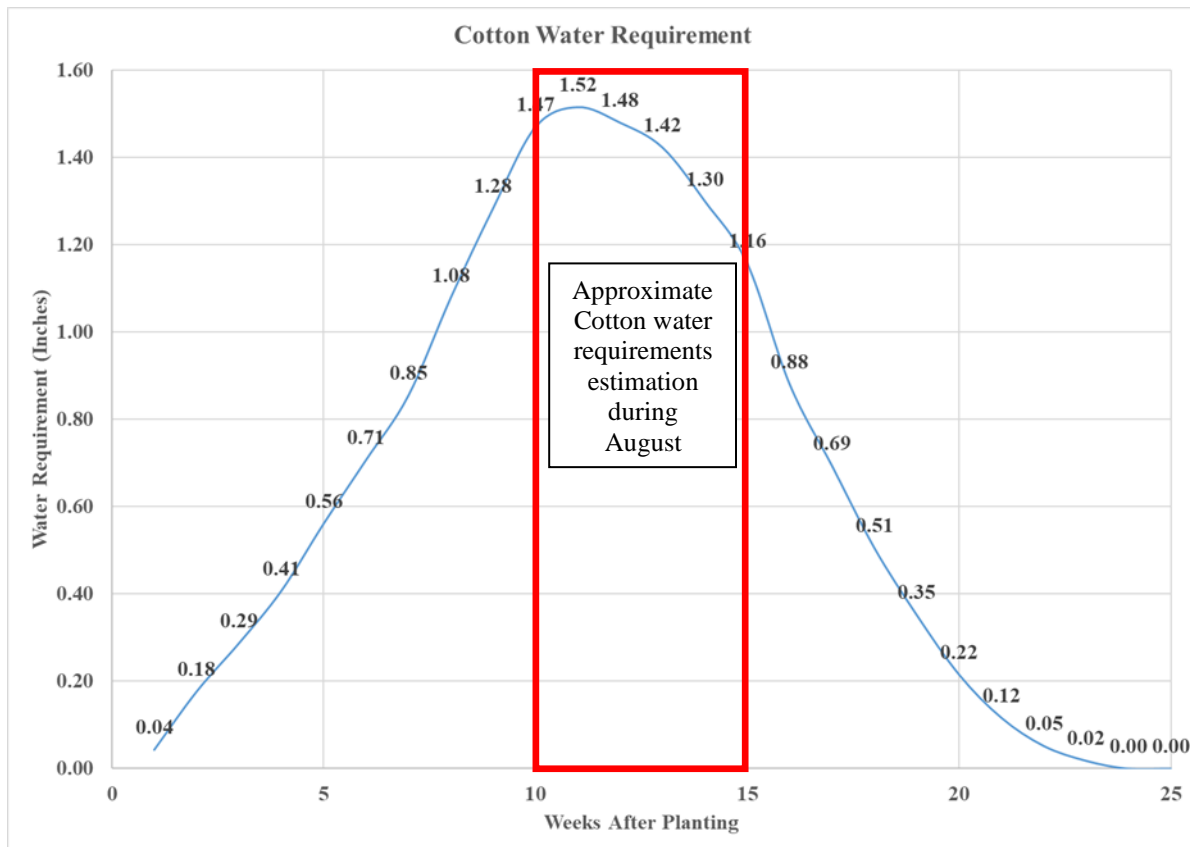
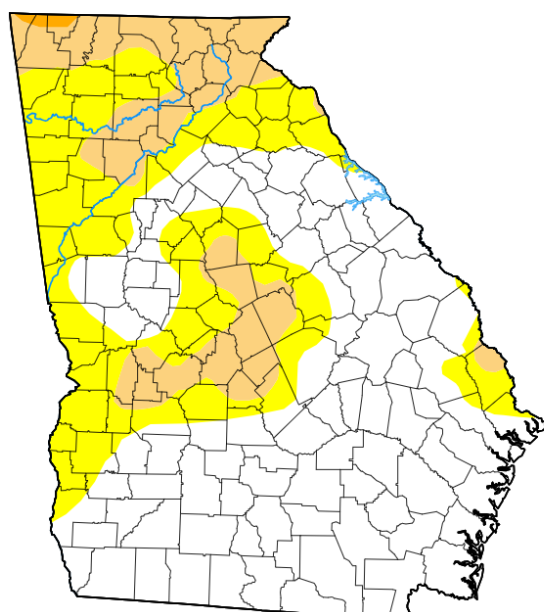


Figure 1. UGA Cotton Checkbook, with the estimated water use period highlighted.

With the recent heavy rainfalls we have received, many may think we are good for a while. With heavy rain events there are a few questions to ask in relation to your soil, how much rain ran off and how much infiltrated? And how much will my soil hold? Both questions are related to the characteristics of your soil which will vary from farm to farm and field to field across the state (data on soils can be found in the UGA Cotton Production Guide Irrigation Chapter). The point is that just because we received 2.5 inches, we may not have but 0.75" or 1" of increase in plant available water according to rainfall intensity and soil conditions.

Another important consideration is root development early in plant development. During extreme variations in weather root development may vary. It is important to maintain adequate moisture within the active root zone. If you aren't seeing moisture being utilized from the deeper depths, be sure to maintain good moisture where the plants are utilizing moisture.



Map released: Thurs. August 1, 2024

Data valid: July 30, 2024 at 8 a.m. EDT

Intensity

- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)
- No Data

Authors

United States and Puerto Rico Author(s):

[Lindsay Johnson](#), National Drought Mitigation Center

Pacific Islands and Virgin Islands Author(s):

[Brad Rippey](#), U.S. Department of Agriculture

Figure 2. The current drought conditions in Georgia as of the end of July.

If you have further questions about irrigation requirements, irrigation scheduling or current water requirements for cotton reach out to your local UGA County Extension Agent.

Physiological Maturity in Cotton - Cutout (*Josh Lee, John Snider, and Camp Hand*): Every UGA Talkin' Cotton podcast introduction says, "getting into the whys of puttin' on, throwin' off, and cuttin' out". In August, most of the cotton around the state will be "cuttin' out" or "blooming out the top". As folks drive by cotton fields, flowers will be easily visible at the top of plants. In this month's newsletter, we will discuss the whys and significance of physiological cutout in cotton.

Cutout

Physiological cutout is defined as the cessation of new vegetative growth. What does this mean in terms of a cotton plant? This means that the bolls that are present at cutout will be the bolls that contribute to yield at harvest. Bolls present at cutout will continue to mature and eventually crack open once there is sufficient heat unit accumulation. For cotton production in Georgia, cutout is defined when nodes above white flower (NAWF) = 3. Due to Georgia's growing season length, weather, and insect pressure, research has shown NAWF = 3 as a better representation for cutout. However, other states in the Cotton Belt use NAWF = 5 due to their production environment. Cutout starts roughly around nodes 18-20 (under ideal conditions).



Figure 1. Plant at cutout NAWF = 3. Photo by Josh Lee.

The timing of cutout will depend on management, variety, and environment. For example, an aggressive plant growth regulator strategy can reduce the number of days until cutout and increase crop earliness. Low nitrogen, limited water access, and pest pressure can also reduce the days until cutout. A cotton plant with a NAWF=5 (low growth potential) at first flower will reach cutout much faster than a plant with a NAWF=10 (high growth potential). Also remember to check cotton varieties. Early-mid season varieties will reach cutout sooner than full-season varieties. Weather conditions with high daytime temperatures and limited cloud cover also hasten days to maturity and harvest.



Figure 2. Cotton field at cutout. Photo by Josh Lee.

Depending on planting date and weather conditions, there will be bolls that are produced by the crop that will not mature in time to contribute to yield (mainly found towards the top of the plant). Under ideal growing conditions, it takes 50 days after flower pollination for a boll to “open”. Flowers and small squares that are produced outside of the effective bloom period (length of time required for a flower to become a harvestable boll) will not contribute to yield.

References

Bednarz, C.W. and Nichols, R.L. 2005. Phenological and morphological components of cotton crop maturity. *Crop Sci.* 45: 1497-1503.

Guthrie, D., Bourland, F., Tugwell, P. and Hake, K. 1993. Charting a course to cutout. In: Cotton Physiology Today. National Cotton Council, Memphis, TN.

Hand, C., Culpepper, S., Harris, G., Kemerait, R., Liu, Y., Perry, C., Porter, W., Roberts, P., Smith, A., Virk, S., Bag, S. 2023 UGA Cotton Production Guide. University of Georgia College of Agriculture and Environmental Sciences, Tifton, GA (2023).

Lee, J.M., Snider, J.L., Hand, L.C., Roberts, P., Culpepper, A.S., Pokhrel, A. and Chalise, D.P. 2023. The effect of pre-drought mepiquat chloride management on cotton sensitivity to drought during peak water demands. Field Crops Res. 298: 108969.

Ritchie, G.L., Bednarz, C.W., Jost, P.H., Brown, S.M., 2007. Cotton growth and development. The University of Georgia, College of Agricultural and Environmental Sciences, Athens, GA. Bulletin 1252.

Cotton Leaves Tell Stories of Disease, Nutrient Deficiencies, and Nematodes in August (Bob Kemerait): One of the most important components of a successful disease and nematode management program in a cotton crop is “timeliness”. “Timeliness” requires applying an effective fungicide before a disease becomes established in a field or before the opportunity to manage nematodes, Fusarium wilt, seedling disease, and bacterial blight has passed. August is a critical month during the cotton season to be both timely for possible fungicide applications this season AND to recognize where early-season management decisions can be improved for next season.

Foliar Diseases As of August, there are four foliar diseases that may be active in some, but certainly not all, cotton fields in Georgia. These include bacterial blight, caused by *Xanthomonas citri* pv. *malvacearum*, Stemphylium leaf spot, caused by the fungus *Stemphylium solani*, target spot, caused by the fungus *Corynespora cassiicola*, and areolate mildew, caused by the fungus *Ramularia* spp. As I finish this article, I have seen target spot and Stemphylium leaf spot but not bacterial blight or areolate mildew. The abundant moisture brought forth by Tropical Storm Debby will risk to development and spread of target spot and areolate mildew; abundant rainfall may also leach potassium from fields leading to increased spread of Stemphylium leaf spot.

There is little that can be done to manage bacterial blight at this time of the season, other than to note if it has occurred in your fields and which varieties have been affected. Noting bacterial blight in a crop now allows growers to make better decisions for variety selection in 2025. Growers have an increasing number of “bacterial blight resistant” varieties from which to choose.

Stemphylium leaf spot (Figure 1) is characterized by numerous small spots with dark purple/brown margins and often times gray, papery centers. Leaves affected by Stemphylium leaf spot are frequently yellow-red in color and often have a “shot-hole” appearance. This disease occurs when the cotton plant is deficient in potassium; potassium deficiencies may exist because of poor soil fertility, perhaps from

leaching after periods of heavy rainfall, or during periods of drought where potassium is not taken up into the plant. Stempylum leaf spot is managed by ensuring proper levels of potassium in the plant; fungicides are not an effective management tool.



Figure 1. Stempylum leaf spot (Photo Bob Kemerait)

Target spot (Figure 2) became evident in southwestern Georgia in the latter part of July and is likely present in many fields across the Coastal Plain of the state. Target spot can develop quickly and is most common in good-growing cotton with high yield potential. Extended periods of leaf wetness, where the foliage in the interior of the canopy remains wet well into the later morning hours, create perfect conditions for rapid development of target spot and premature defoliation from it. Fungicides are an important management tool for target spot, though use does not always result in increased yields. From our research, effective use of fungicides should be considered between the first and sixth week of bloom where the third week of bloom is typically the most critical time of management. Scouting before use of fungicides to determine if the disease is present help to ensure that an application is warranted. Priaxor and Miravis Top are currently the most effective fungicides for control of target spot, though Headline, Quadris and others are also effective.

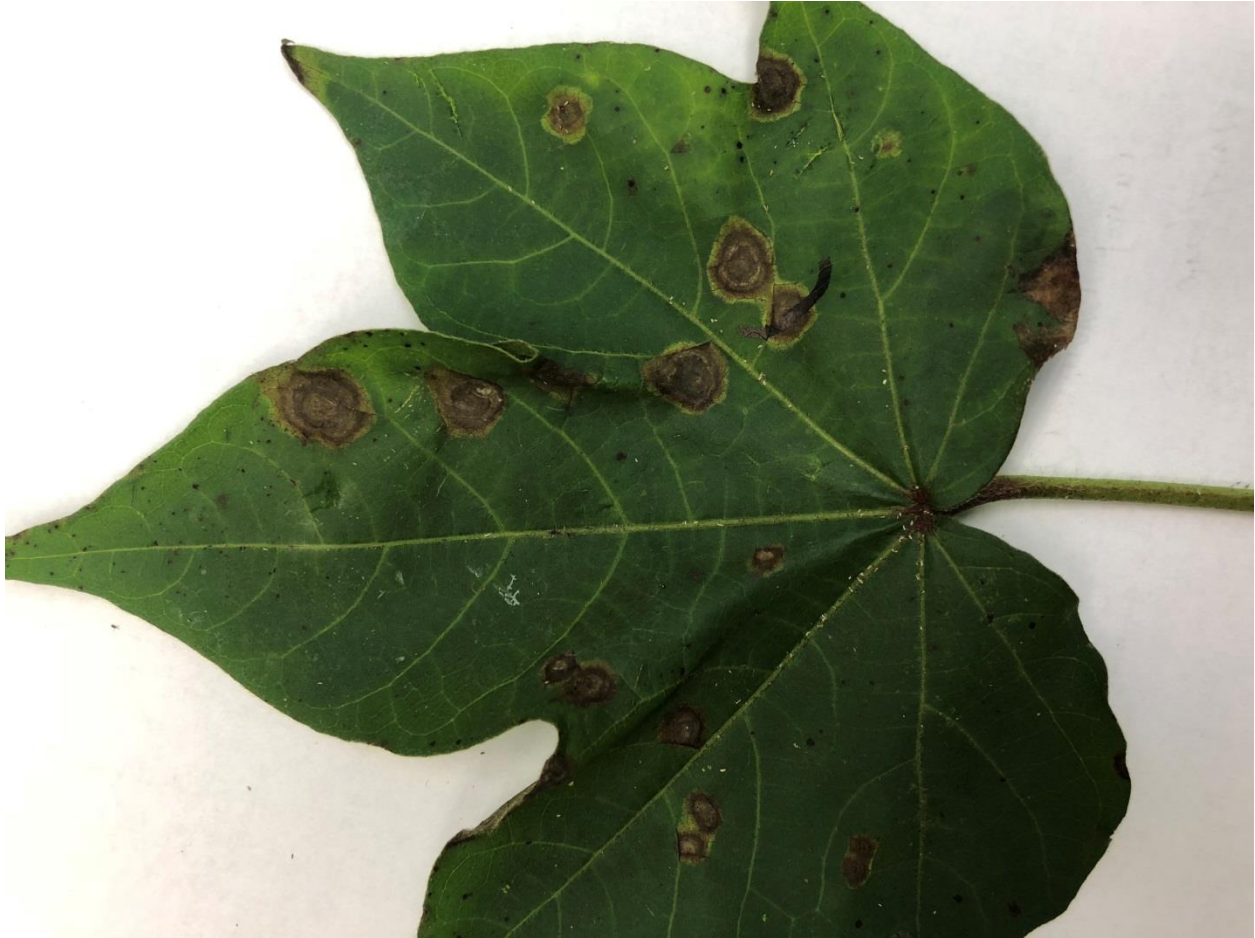


Figure 2. Target spot (Photo Jason Brock)

Areolate mildew (Figure 3) has been increasingly severe in Georgia since 2017. Areolate mildew was historically confined to southeastern Georgia east of I-75; however it can be found across Georgia now. When areolate mildew arrives late in the season it may not result in any loss in yield and use of a fungicide is not warranted. In fact, late-season defoliation may help to reduce boll rot. However, when the disease occurs more than a month ahead of anticipated defoliation, Priaxor and Miravis Top are effective at minimizing losses and protecting yield. (Until last year azoxystrobin was also an effective fungicide for management of areolate mildew; research continues in 2024 to determine if it is still an appropriate fungicide.)

Growers within three weeks of defoliating their cotton need not worry about managing areolate mildew. Where areolate mildew occurs in a crop with anticipated defoliation a month or more away, and weather is favorable for continued development and spread of the disease, then use of a fungicide is very often beneficial to protect yield by as much as 200 pounds of lint per acre.



Figure 3. Areolate mildew (Photo Jeremy Kichler)

The distinctive interveinal chlorosis (“tiger striping”) associated with nematode damage in cotton is presented in Figure 4. It is too late to protect our 2024 cotton crop from plant-parasitic nematodes or Fusarium wilt; however now is the time that symptoms become very evident in the field. Where stunting, poor growth and even dying plants are found in areas of a field, growers should take measures to determine 1) if it is caused by nematodes 2) if so, what kind of nematodes, and 3) if Fusarium wilt is also involved. Detection and identification now will help growers to make best variety selection and possible use of nematicides in 2025.



Figure 4. Interveinal chlorosis “tiger striping” associated with root-damage from plant-parasitic nematodes (Photo Bob Kemeraït)

Important Dates:

Southwest Research and Education Center Field Day – Plains, GA – August 15, 2024

Cotton and Peanut Research Field Day – Tifton, GA – September 4, 2024

J. Phil Campbell Cotton Field Day – Watkinsville, GA – September 24, 2024

Georgia Cotton Commission Annual Meeting and UGA Cotton Production Workshop - Tifton, GA – January 29, 2025