UNIVERSITY OF GEORGIA EXTENSION

UGA Cotton Team Newsletter
June 2024

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Squaring Cotton and Plant Monitoring (*Josh Lee, John Snider, Camp Hand*): As the 2024 cotton planting season winds down, it's a good time to think about the next cotton developmental stage. Management decisions are dependent on cotton growth stage. For example, after emergence we need to be scouting for thrips and assessing if post-emergence herbicides are warranted. During squaring we need to think about applying PGRs to aggressively growing cotton, side-dressing the crop with nitrogen, and tarnished plant bug pressure. Nitrogen and PGR management are two important decisions that growers must make to maintain a balance between vegetative and reproductive growth. Application timing are key considerations for PGR and nitrogen management in cotton. Therefore, knowing what stage the crop is currently at will aid in knowing exactly when to make the best management decision for your crop. In this month's newsletter we will be discuss the significance of the squaring stage, plant height, and mainstem nodes.

Squaring

What does squaring in cotton mean again? Squares refer to the small floral green buds that are encased by three bracts (triangle shaped leaves that cover the floral bud) that form the shape of a pyramid rather than an actual square. The name of each squaring stage is dependent on the size of the floral bud. For example, at the start of squaring the crop is at pinhead (the floral bud is the size of a ballpoint pen head), then match head (size of a match head), square growth midpoint, next is the candling stage (a light-colored floral bud protrudes for the bracts and looks like a lit candle), and finally the candle will become an open flower. Pinhead square occurs approximately at 35 days after planting (dependent on environmental conditions) and candling will occur three weeks after pinhead, which completes the squaring stage.

As the squaring phase progresses, be sure to monitor for square retention. This can be done by walking the field and looking at 100 pinhead or matchhead first position squares. If you observe that there are 20 missing first positions out of 100, then your square retention is 80%. At first bloom the goal is to achieve at least 80% first position square retention. If tarnished plant bug pressure is present, insect collection with a sweep net may be necessary.

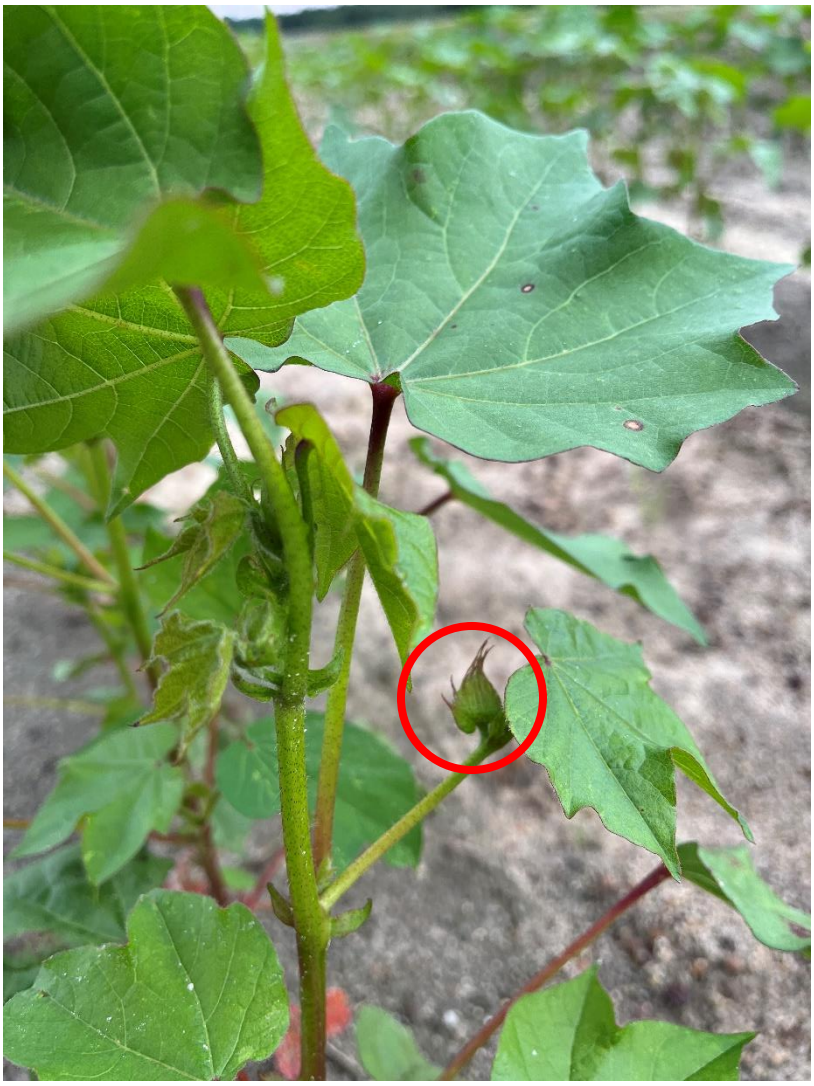


Figure 1. Red circle indicating a match head square. Photo by Josh Lee.

Plant height

Plant height is dependent on several factors including environment, management practices, and variety. Recommendations from UGA suggests that cotton should reach a final heigh of 44-50 inches, but this number will vary. Another monitoring tool for PGR management is measuring 4th internode length. This is done by measuring the internode distance between the 4th and 5th node from the top of the plant terminal. If the 4th internode length is greater than 2-3 inches, an application of PGR may be warranted.

Figure 2. Plant height in the early season. Photo by Josh Lee.

Mainstem nodes

A node is point where leaves and branches attach to the mainstem. Cotton develops a new node every 3 days. Node development can only take 2 days if higher temperatures speed up development. Cotton will develop around 21-23 nodes but can go above 25 in aggressive varieties. The first fruiting branch will occur around node 5-7. At the end of the season, approximately 20-22 fruiting branches per plant will contribute to boll production.

With the squaring stage underway it is important to monitor your crop and make timely management decisions. For more information on crop growth monitoring please refer to the UGA cotton production guide. For more PGR information please refer to the Cotton Growth Monitoring and PGR Management UGA extension publication https://extension.uga.edu/publications/detail.html?number=C1244&title=cotton-growth-monitoring-and-pgr-management.

References

Catchot, A. and Gore, J. Importance of monitoring square retention in young cotton. 2014. Mississippi Crop Situation. https://www.mississippi-crops.com/2014/06/19/importance-of-monitoring-square-retention-in-young-cotton/

Guthrie, D., Silvertooth, J. and Stichler, C. 1993. Monitoring plant vigor. In: Cotton Physiology Today. National Cotton Council, Memphis, TN.

Hake, K., Carter, F., Mauney, J., Namken, N., Heitholt, J., Kerby, T. and Pettigrew, B. 1992. Square retention. 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).

Hand, C., Snider, J. and Roberts, P. 2022. Cotton growth monitoring and PGR management. (Publication No. 1244). University of Georgia Cooperative Extension.

Stewart, M., Hake, K., Oosterhuis, D., Kerby, T., Mauney, J. and Timpa, J. 1993. Cotton fruit development-the square. In: Cotton Physiology Today. National Cotton Council, Memphis, TN.

June Cotton Irrigation Update (*Phillip Edwards, David Hall, Daniel Lyon, Jason Mallard, Wesley Porter*): To say, "Each year we see different patterns in weather," seems the new norm. In recent weeks, certain areas of the state seem to have been saturated and inundated with too much rainfall, while others are irrigating corn. Though this is a Cotton Irrigation update, this shift brings an important point to mind. While we do not want to keep an overabundance of moisture (keeping the moisture level at field capacity or "full"), we do want to keep adequate moisture to maintain the crop. As we have seen in the past and are rapidly seeing on corn currently, once we fall behind on moisture, it's hard to catch on irrigation alone, unless an adequate amount of rainfall is received. When crops are utilizing moisture as fast as we apply it, it's hard, if not impossible, to bring soil moisture levels back to an adequate level. For example, allowing an 8" depth soil moisture sensor to fully deplete and then irrigating will sometimes (according to application rate), provide very little increase on moisture at the sensor's 8" level, as shallower depths are refilled first. The crop often utilizes moisture as fast as we apply it, highlighting the importance of not getting behind in soil moisture. Also, it is near impossible to have an effect on deeper soil moisture sensors with irrigation alone in our region, so as deep moisture is lost it may not be possible to replenish it with irrigation.

Young cotton plants do not require a lot of moisture for the first few weeks, but it is important not to stress the crop. Earlier planted cotton will be moving into first flower by the end of June. Thus, staying on top of water requirements will become critical throughout the month of June and into July for the entirety of the crop regardless of planting date. Additionally, even later planted cotton may need some irrigation to ensure there is enough soil moisture available for the crop. Remember, that if there is no rainfall, the water requirements need to come from somewhere, in this case irrigation. Our Irrigation Reference Guide for Corn, Cotton, Peanuts, and Soybeans |

UGA Cooperative Extension shows estimated water requirements in both days after planting and estimated growth stage, based on the physiological progression of the crop it may be better to look at the growth stage and not the DAP. Now is a good time to review the cotton irrigation schedule, determine where you currently are and decide what your water requirements are.

Cotton Irrigation Schedule				
Growth Stage	**DAP**	**Weeks after Planting**	**Inches/Week**	**Inches/Day**
Emergence	1 - 7	1	0.04	0.01
Emergence to First Square	8 - 14	2	0.18	0.03
	15 - 21	3	0.29	0.04
	22 - 28	4	0.41	0.06
	29 - 35	5	0.56	0.08
First Square to First Flower	36 - 42	6	0.71	0.10
	43 - 49	7	0.85	0.12
	50 - 56	8	1.08	0.15
First Flower to First Open Boll	57 - 63	9	1.28	0.18
	64 - 70	10	1.47	0.21
	71 - 77	11	1.52	0.22
	78 - 84	12	1.48	0.21
	85 - 91	13	1.42	0.20
	92 - 98	14	1.30	0.19
	99 - 105	15	1.16	0.17
	106 - 112	16	0.88	0.13
	113 - 119	17	0.69	0.10
First open boll to >60% Open Bolls	120 - 126	18	0.51	0.07
	127 - 133	19	0.35	0.05
	134 - 140	20	0.22	0.03
	141 - 147	21	0.12	0.02
	148 - 154	22	0.05	0.01
	155 - 161	23	0.02	0.00
Harvest	162 - 168	24	0.00	0.00
	169 - 175	25	0.00	0.00

Based on planting observations and where most of the crop is, most farmers should fall within the first square to first flower stage (or the yellow highlighted area) throughout the month of June. If you were unfortunate and did not get your cotton planted until later May or early June then you will fall into the emergence to first square stage (highlighted in red). Crop water requirements increase dramatically from squaring and flowering. From 30 days to 50 days after planting, water consumption almost doubles. Keep this in mind as we move into middle and late June, and into early-July. Don't fall behind on your irrigation once the crop reaches squaring and into flowering. As a reminder don't forget that typically as water use increases is in late-June through July, usually so does very hot and dry weather, so keep this in mind and stay on top of your irrigation applications. Conversely, don't over-irrigate the crop as there are yield penalties for doing so. Remember that if you have been using soil moisture sensors, be sure you are irrigating based on the crops actual root zone and not the entire length of the sensor. Root growth and water usage will dramatically increase at deeper depths as the cotton moves through squaring and into bloom during mid to late June and early July. As we move through the season we will need to be more balanced as the season progresses and root growth increases. One last consideration, top dressing all cotton and our first dose of growth regulator on aggressive irrigated growing cotton will soon or has already taken place. Don't go into this stage with the mindset of "I'm going to hold back on the water now because I don't want it to take off". If proper growth regulator is applied, it will prevent vegetative growth as it should. If rain chances are low, irrigation will be required to get the fertilizer in the plant by irrigating it in and allowing the plant to uptake the nutrients. For further questions about mid-season cotton irrigation management contact your local county Extension Agent.

Opportunity for Early-Season Disease Management (*Bob Kemerait*): Cotton farmers know that nematodes, Fusarium wilt, seedling disease, and bacterial blight are fought before the furrow is closed with use of resistant varieties, nematicides, and fungicides. After that, our management opportunities for these problems vanish. Growers know that Stemphylium leaf spot is fought throughout the season by managing the potassium available to the cotton crop. Growers know that as the crop begins to bloom, attention needs to focus on the opportunity for fungicide applications for management of target spot and areolate mildew. Growers also know there is very little that can be done to protect against boll rot, at least boll rots that are caused by fungal pathogens.

Given all of this, what is there that growers can do between closing the furrow and watching for blooms in the never ending battle against diseases and nematodes? There is almost nothing that needs to be applied for management during this stretch, with the exception of Vydate-CLV. Depending upon rate, Vydate-CLV can be applied once or twice to the cotton crop between the 5^{th}-to-7^{th} true leaf stage and pinhead square as a supplement to nematicides used prior to closing the furrow.

What can growers do between closing the furrow and observing blooms? What should growers be doing? There are three things that should be done in this period that may help this crop and may help future crops. These include the following.

1. Manage potassium levels as possible to reduce risk to Stemphylium leaf spot.
2. Scout for areas of poor growth and on-set of interveinal chlorosis/tiger-striping in the leaves. When such is observed, growers should check for root galls and vascular discoloration to identify root-knot nematodes and/or Fusarium wilt. Growers should pull soil samples to determine if sting, reniform, or root-knot nematodes are associated with

the symptoms. If any of these are identified, growers should a) work to avoid carrying infested soil from this field to other fields by cleaning tires of equipment (tractors, sprayers, etc.) and b) make plans for mitigating this problem in future seasons.

3. Growers should work to manage the current crop so as to avoid the rank growth that increases risk to target spot and boll rot.
4. Growers should have some plan for choice of fungicides should they become necessary later to battle areolate mildew and target spot.

While growers focus on things other than diseases and nematodes during the stretch between planting and bloom in a cotton crop, giving some attention even now to diseases and nematodes can make a difference for the current crop and for crops in the future.

Knowing the Nutritional Status of your Cotton (*Henry Sintim and Glen Harris*): We had a fairly wet spring this year, which also restricted field access and delayed planting. Such wet conditions have both good and bad implications from a nutrient management perspective. There is a vital relationship between plant nutrient uptake and soil moisture conditions, and thus on a good side, the adequate soil moisture conditions would enhance nutrient solubility and availability. However, too wet field conditions would result in stunted cotton growth, with the crop showing several nutrient deficiency symptoms despite adequate soil nutrient levels. This is largely due to anaerobic soil conditions that restricted plant nutrient uptake. Plant growth becomes impaired when the oxygen level drops below 10%. Also, too wet field conditions would cause the leaching and runoff of nutrients, especially mobile nutrients such as nitrogen.

Early planted cotton might be getting closer or already at the square stage, which is the time to consider side-dress nitrogen (N) application. the University of Georgia Extension recommendation is to split-apply N in cotton. The total N rate for cotton is based on soil type, previous crop, growth history, and yield potential. The base N rate for 750; 1,000; 1,250; and 1,500 lb/ac lint yield is 60, 75, 90, and 105 lb/ac N, respectively, with the recommendation for 1,250 and 1,500 lb/ac lint yield assuming irrigated conditions. Recommended adjustment to the base rate is as follows:

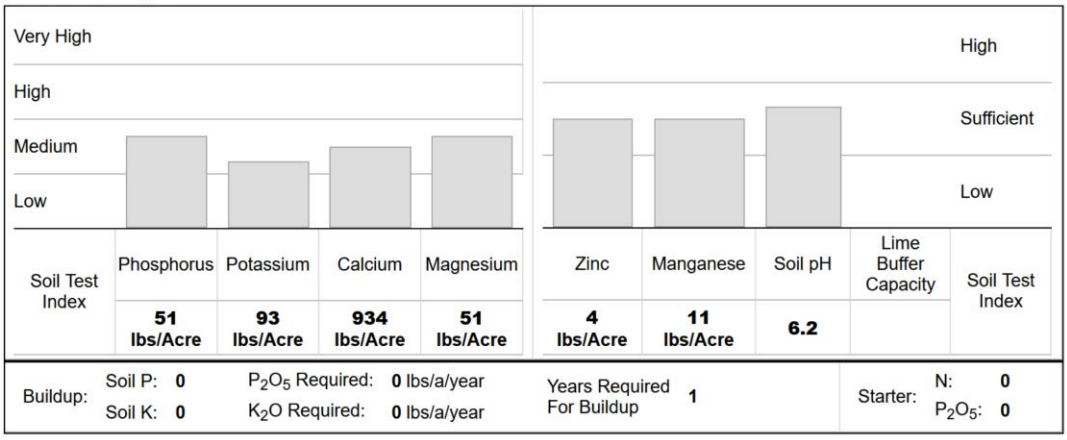
Factors to increase the base N rate by 25%	**Factors to decrease the base N rate by 25%**
• Farming in deep sandy soils	• Cotton following a leguminous crop such as peanuts or soybeans
• The previous crop was cotton	• Cotton following a good establishment of winter legumes, such as clover or vetch.
• There is a history of inadequate stalk growth	• There is a history of rank or excessive vegetative growth.

The current recommendation is to apply between 25% to 33% of the total N rate at planting, and the remainder as side-dress between the square and 1st week of bloom stages. Make side-dress application closer to the square stage if the plant is showing stunted growth and the

leaves are chlorotic (pale, yellow, or yellow-white). Side-dress application closer to the 1st week of bloom is suggested if the crops show good vigor with dark green foliage. If possible, a two-way side-dress application (half at the square stage and the remaining half between the 1st and 2nd week of bloom) would work fine. This would actually be beneficial in seasons of intensive rainfall conditions at critical stages, as has been the case this year.

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. 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 in-season nutrient management intervention. Nutrient recommendations for greater cotton yields in the state are by adjusting the N, P, and K 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.

Soil Test Report



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/).

Figure 2 also shows the recommended nutrient sufficiency ranges for plant tissue analyses for cotton. It is important to stay within the sufficiency range as lower or higher levels can cause problems. For instance, low N rates can reduce yield and quality while excessive N rates can cause rank growth, boll rot, delayed maturity, difficult defoliation, and poor quality and yield.

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

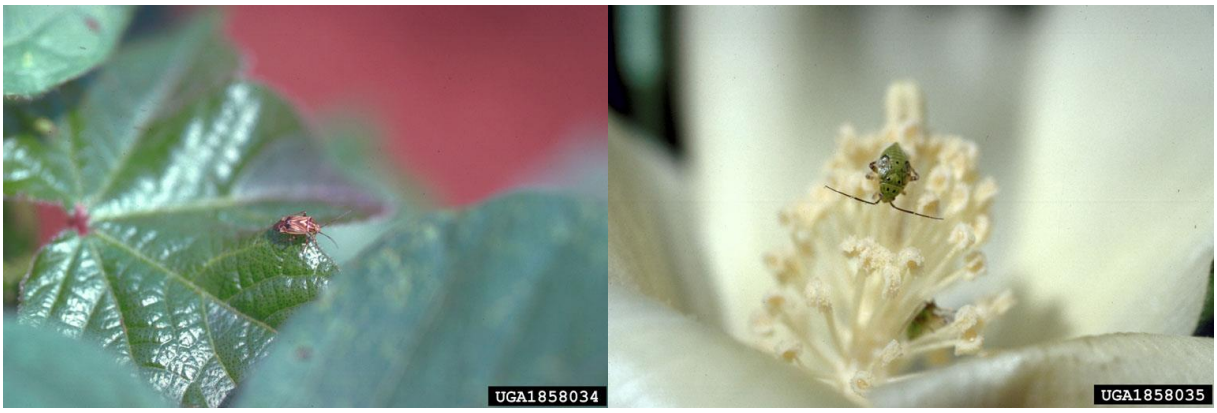
Using a Rotary Hoe to Rescue a Cotton Stand (*Wade Parker*): The rain has all but stopped in East Georgia, especially compared to what it was earlier in the planting season. As a result, soil crusting issues have dropped immensely. However, during the time period of regular rainfall, soil crusting was a household term, along with whether or not to use a rotary hoe.

There are definitely pros and cons to using one, including the effectiveness in fracturing crust and allowing seedlings to emerge. However, rotary hoes can also damage emerging seedlings if not used properly and under certain conditions. When deciding, evaluate the situation carefully. If irrigation is available or if a high chance of rain is expected, moisture should soften the soil, thus allowing for emergence. Also, pay close attention to how much stress the seedling is underneath the surface. If the seedling is corkscrewed with a swollen hypocotyl, time is not on your side and a decision needs to be made quickly. If this is the case, then using a rotary hoe is warranted and worth the risk of losing a few seedlings to save the greater mass. Using a rotary hoe is more effective in dry soils vs. wet, as wet soils will just allow the spikes of the hoe to be driven down and won't fracture the soil. I used to question how fast growers would run a rotary hoe across the field, but a fast tractor speed of 8-10 mph encourages fracturing. You want to set it deep enough to where it just fractures the soil and not go anymore deeper than what you have to do. A quick method to determine the effectiveness of a rotary hoe is to place colored flags at emerged and non-emerged seedlings. Do this at several places over the field. Make a pass over the flagged seedlings, then evaluate damage and effectiveness. You can calculate % loss due to how many non-damaged vs. damaged seedlings occurred (ones that were flagged). Fuel consumption for a rotary hoe is small, so the financial input for this operation is small. This is something to consider when deciding whether to use this tool for soil crusting and stand emergence. If growers do use this practice, you will know whether or not you made the right decision 24 hours later.

Tarnished Plant Bug Management (*Phillip Roberts*): Tarnished plant bug has been a more frequent pest of cotton in recent years. Without question all fields need to be scouted for plant bugs and square retention should be monitored. The most common damage from plant bugs is feeding on small squares in the tops of plants. However, plant bugs may also feed on large squares and small bolls. Plant bugs insert their needle-like mouthparts into fruiting forms and feed on the contents. A small square damaged by plant bugs will be aborted by the plant. This shedding process takes a few days. Initially the square will turn off color, then yellow, and eventually dry up or drop from the plant. A healthy square is firmly attached to the plant, when monitoring retention if a square easily detaches from the plant it was likely damaged. Plant bugs may feed on larger squares which will not be shed by the plant. When that position flowers you will likely see localized discoloration on the anthers or misshapen leaf petals (we refer to these as "dirty blooms"). The presence of dirty blooms suggest you may have plant bugs, especially immature plant bugs and drop cloth sampling would be recommended. Some plant bug feeding occurs on small bolls and the damage would be similar to what we observe for stink bug feeding on bolls.

Square shedding due to tarnished plant bug feeding (left) and a dirty bloom resulting from tarnished plant bug feeding on a large square. Images by Ron Smith, Auburn University, Bugwood.org.

Adult tarnished plant bugs are about ¼ inch long with a general brown color mottled by patches of white, yellow, reddish-brown or black. A light-colored "V" on the scutellum (behind the head) and two light-colored patches further back on the wings are characteristic. Eggs are about 1 mm long and are almost always embedded into plant tissue, and thus not easily found. Immature tarnished plant bugs typically vary from yellowish-green to dark green or brownish. Early instars can look like an aphid, but tarnished plant bug nymphs run quickly whereas aphids are docile and move very slowly. Later nymphal instars have four dark-colored spots on their thorax and one spot in the middle of the abdomen. Plant bugs have a large host range and survive the winter as adults on wild host plants. Females lay 50-150 eggs which hatch in 7-12 days and nymphs develop into adults in 15-25 days.



Tarnished plant bug adult (left) and nymph (right). Images by Ron Smith, Auburn University, Bugwood.org.

Scouting plant bugs can be accomplished by monitoring square retention and being observant for plant bugs, using a sweep net (pre-bloom), using a drop cloth (after bloom), or preferably a combination of monitoring square retention and sampling for plant bugs.

Square retention counts should be made once cotton begins fruiting and continuing into the 2nd week of bloom. As we get further into bloom, square retention is a less reliable indicator of possible plant bug feeding due to natural square loss for various reasons. To make a square retention count gently pull the top two main stem leaves apart and look for the presence or absence of a small square. Typically, we teach scouts to monitor a single fruiting site per plant. The threshold is when plants are retaining less than 80% of small squares and plant bugs are observed. It is also a good idea to randomly pull plants in the field to monitor overall square retention. Again, our goal is to maintain 80 percent of all first positions when we enter bloom. Plants with 80 percent first position square retention at first bloom still have maximum yield potential.

Sweep nets (15-inch diameter) are a good toll for monitoring plant bug adults on squaring cotton. Adult plant bugs are elusive, so walk quickly when sweeping. Drop cloths are the preferred sampling tool in blooming cotton and are much more effective in detecting plant bug nymphs
Plant Bug Thresholds:

First two weeks of squaring:
Sweep Net: 8 plant bugs per 100 sweeps
Drop Cloth: 1 plant bug per 6 row feet

Third week of squaring through bloom:
Sweep Net: 15 plant bugs per 100 sweeps
Drop Cloth: 3 plant bugs per 6 row feet

Insecticides recommended for plant bugs include Orthene, Bidrin, Admire Pro, Diamond, Vydate, Transform, and Centric. A few comments on each.

Orthene and Bidrin are organophosphates. Orthene is very active on plant bugs, however it is also is hard on beneficial insects and tends to flare spider mites. Orthene does not have activity on aphids and would likely exacerbate aphid populations if present. Bidrin is also very active on plant bugs and hard on beneficial insects. The Bidrin label only allows higher use rates such as 4-8 ounces per acre from first bloom to 30 days prior to harvest. Bidrin will provide some control of aphids. Delaying use of Orthene and Bidrin until later in the season (after bloom) is advisable.

Transform is very active on plant bugs and provides good control of aphids and is not as hard on beneficials as the OPs. Centric provides good control of plant bugs and decent but sometimes erratic control of aphids. Both of these products would be good choices when targeting plant bugs on squaring cotton. Admire Pro (imidacloprid) has some activity on plant bugs and some activity on aphids and would not be the treatment of choice if plant bug populations were high. Vydate provides fair control of plant bugs and has little to no activity on aphids.

Diamond is an insect growth regulator and is only active on immature plant bugs. Diamond will not control adults. Diamond is used on many acres in the Mid-South where plant bugs are an annual problem. Diamond performs best when applied before the situation is out of control. If you have fields where high adult populations have been observed and nymphs are starting to be found, Diamond would be a good option. In situations where adults are also being found, a knock down insecticide for adults will also be needed.

It can be difficult to obtain control of plant bugs once nymphs are embedded in a field. Be sure to obtain good coverage and potentially make more than one application if populations are high.

Let's hope that plant bugs will not be a problem. Current plant bug infestations on the station in Tifton are low, but that can change in a matter of days if plant bugs start migrating from wild host to cotton. The only way to know if you have plant bugs is to scout. Make good decisions, only make insecticide applications if thresholds are exceeded as some plant bug insecticides can be very disruptive. In the last couple of years, it appears plant bugs are more common on our earliest planted cotton. April planted cotton is squaring so start running sweep nets and monitoring square retention.

Important Dates:

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