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Louisiana Crops NEWSLETTER

CORN • COTTON • GRAIN SORGHUM • SOYBEANS • WHEAT

ISSUE HIGHLIGHTS

Too hot, too dry

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➤ Surge irrigation events, use sensors and take other steps to maximize moisture. *Page 2*

➤ Corn leaves may die earlier this year. *Page 4*

Harvest preparations

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La. soybeans in need of water

BY TODD SPIVEY

Most, if not all, soybeans in Louisiana have reached the reproductive growth stages. Visiting fields from Morehouse Parish to Calcasieu Parish in the past two weeks, I have seen fields ranging from R2 (full bloom) to R6 (full seed).

This time in soybean development — from bloom and pod initiation to mature seed — is a critical juncture. Stress at these stages, especially water stress, can severely reduce yield. Unfortunately, as of the most recent iteration of the U.S. drought monitor (July 17), more than 75 percent of the state is at best abnormally dry. Another 30 percent of the state, including 18 major soybean-producing parishes, is at best in the D1 drought stage (moderate drought).

Water stress during the growing season has the potential to reduce yield regardless of the developmental stage at which the stress occurs. During the vegetative development of the plant, water stress will reduce the length of the internodes, resulting in an overall reduction of plant height. Often, however, plants that face water stress during early vegetative development show an increased tolerance to water stress later in the growing season.

Daily soybean water demands will peak at R1 (first bloom), when plants can use up to 0.3 inches of water per day. Yield reductions due to water stress during early reproductive development (first bloom to pod initiation) occur due to a reduction in the number of pods per plant through the abortion of flowers. Even though water demand will peak at R1 and water stress can reduce the number of pods per plant, this is not the most critical stage for productivity.

The greatest yield reductions due to water stress typically occur between R4 (full pod) and R6. Depending on when the water stress begins during these stages, yield reductions can occur due to reduced

number of seeds per pod or due to reduced seed weight. It has been reported in soybeans under water stress conditions during pod fill that each 0.5 inch of additional water has the potential to increase productivity by as much as 2.5 bushels per acre.

Therefore, as many fields approach maturity, producers with irrigation capabilities should continue to monitor fields for potential water stress through the pod fill stages. At R6.5 (**Figure 1**), when the seeds have separated from the white membrane connecting them to the pod, the seeds have reached their maximum dry weight. At this point, additional water will not increase yield. §

Figure 1. At left, R6 soybean with seeds still attached to the membrane.
At right, R6.5 soybean separated from the membrane with clearly defined seed margins.

How to maximize irrigation effectiveness

BY STACIA DAVIS CONGER

This has been a tough crop season in terms of water management. In the February issue of this newsletter, I predicted the lack of normal winter rains would leave soils without the deep water storage required to minimize the need for irrigation during the crop season. Since then, we have experienced a very wet and cold spring, with rainfall totaling 23 inches and monthly average maximum temperatures falling 6 degrees Fahrenheit lower than in January to April 2017. Unfortunately, the spring season accounted for 84 percent of the rainfall for this year, and monthly average maximum temperatures have shifted to 5 degrees above 2017 highs, resulting in an extremely dry and hot crop season thus far.

Soil moisture sensor data from this year on a sandy clay loam indicated spring rains were fully depleted on the surface within a month of planting (May 17), falling to 5 percent by volume (**Figure 1**). When surface moisture became fully unavailable

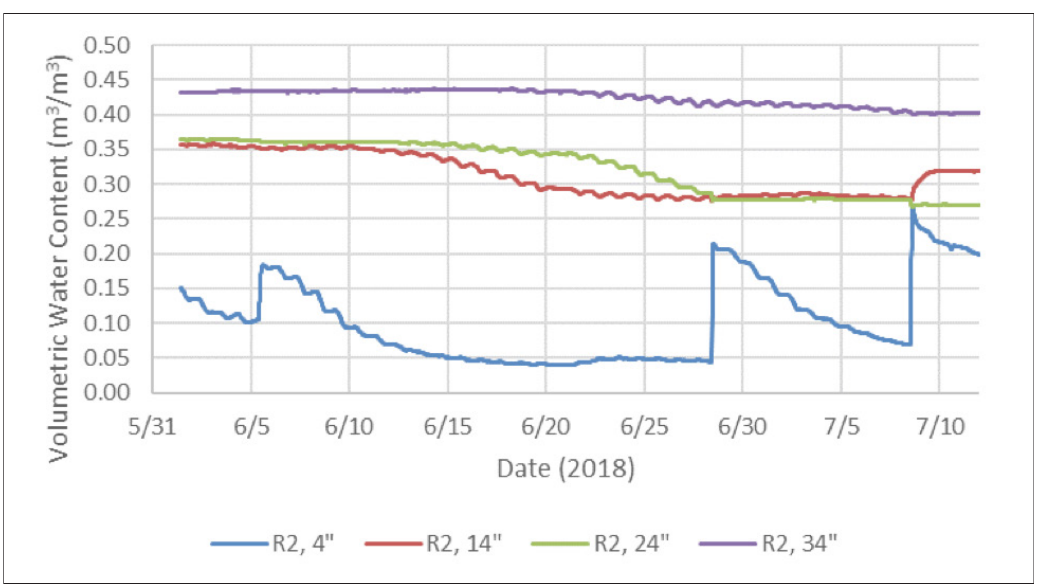

Figure 1. Soil moisture data collected in 2018 from an eight-row soybean plot on sandy clay loam soil as part of an economic evaluation of delaying irrigation to take advantage of forecasted rainfall.

(about June 14), the roots started pulling water from lower depths, resulting in continued decline in overall moisture availability. This plot was irrigated on June 28 and again on July 8 and was purposely delayed as part of the treatment.

After the first irrigation, it became apparent there was good infiltration at the surface but only enough water to stabilize water loss at deeper depths with continued decline in soil moisture at 34 inches. To encourage deeper infiltration, the second irrigation event received the same full event as the first plus an additional soak event by irrigating again after less than a few hours. The soak event increased infiltration at the surface compared to the first event, increased overall moisture at 14 inches below the surface and stabilized the deeper depths, including at 34 inches. Additional soak events would continue to improve infiltration over time.

Irrigation is critical to a healthy, high-yielding crop during drought, but it has become very important to irrigate effectively considering the economic impacts of the number of events needed. Typical continuous furrow irrigation events over-apply water at the top portion of a field, but generally under-apply across the bottom portion.

Given the amount of labor required to set up and manage furrow irrigation, it's understandable to want to push as much water down the furrows as quickly as possible and over the most acreage. However, high flow rates of water down the furrows on Louisiana soils that commonly have low infiltration rates can lead to decreased infiltration. A good, effective furrow irrigation event requires a slow flow rate (less than 10 gallons per minute, or gpm) as the water advances down the field. An even lower flow rate may be necessary on short rows.

To get the most out of an irrigation event, consider the following:

Run computerized hole selection software to handle the fluid dynamics of the design. A good design will include:

— Maximum pressure head less than 2.5 feet.

— Furrow flow rate less than 10 gpm.

— Good uniformity (target > 90 percent).

Tips for creating a better design include:

— Adjusting the field size.

— Adjusting water source flow rate by changing variable pump settings.

— Changing the pipe size and thickness.

Surge irrigation events to get a more even distribution of water down the field. This will help reduce over-irrigation at the top of the field and improve infiltration at the end of the field. Some have invested in surge valves to automatically surge, but it can also be done manually by alternating irrigation between two or more fields throughout the event until all fields water out.

Add soak events to the irrigated field to continue pushing water into the soil. Soak events occur after the irrigation event ends and the furrows are still slick, with no standing water. These events will be much shorter than the original event.

Use a soil moisture sensor to get feedback about the effectiveness of irrigation and rain events. It also helps determine how the roots are pulling water and whether the crop was stressed before showing visual signs in the plant.

Be prepared by designing your irrigation during the winter. Irrigation is usually the last task for farmers because its importance varies with the weather. Making a general plan that can be adjusted quickly during the crop season can save a lot of time and reduce overall stress. For example, a change in irrigation design can require additional fittings, valves or other parts that may not be in stock or even require a special order. Waiting until the busy crop season can delay timely irrigation to the crops.

Note: The data presented in this article was collected at the LSU AgCenter Red River Research Station and was presented for illustrative purposes only. Conditions that affect rainfall, maximum temperatures and soil moisture may have been different outside of the immediate area where the data was collected. §

Drought, heat stress hasten corn leaf dieback

BY DAN FROMME

As corn progresses toward physiological maturity, the leaves naturally begin to senesce, or die. The timing and pattern of leaf senescence are genetically regulated but are also influenced by environmental triggers, including severe photosynthetic stress. This year, much of the grain-filling period has experienced severe drought and heat stress, so the onset of leaf senescence can occur earlier than expected prior to kernel black layer. This means leaves begin to die sooner than expected, and the leaf pattern of leaf senescence sometimes changes.

In most years, leaf death begins at the bottom of the plant and slowly moves toward the upper leaves. However, this year, due the late-season stress, leaf senescence is progressing from both the bottom and top of the plant. Green leaves are remaining in the middle of the plant for some time until complete leaf senescence occurs. Also, these fields have an unusual golden glow in the upper canopy against the morning or evening sun. The effect on grain yield will depend on how early in the grain-filling period the death of the upper leaves occurs. This year, test weights might be lower than expected. §

ABOVE AND BELOW: These photos show top leaf death in irrigated corn at the Dean Lee Research and Extension Center near Alexandria, Louisiana, on July 17, 2018.

The corn pictured is at the three-quarter milk stage. The dieback was primarily a result of high temperatures.

Using harvest aids in grain sorghum

BY DAN FROMME

Applying a harvest aid to grain sorghum has become a common practice in Louisiana. When properly applied, they permit faster and more efficient combining, with no reduction in grain weight. Grain moisture content will be more uniform across the field, which can result in fewer moisture discounts.

It is easy to determine the black layer stage of kernel development, which is when harvest aids should be applied. A black layer forms at the seed attachment point at physiological maturity when maximum seed weight is reached. At black layer, the vascular tissue, or phloem tubes, can no longer carry nutrients and water to the grain, and the seed can no longer increase in dry weight.

Benefits of harvest aids

Grain sorghum producers may consider harvest aids to manage sorghum dry-down and harvest for several reasons, including:

— Provide for more efficient and faster threshing.

— Dry out the late-emerging, non-productive suckers or tillers that could delay harvest.

— Reduce differences in harvest maturity across a field due to uneven emergence dates.

— Kill grain sorghum, which is a perennial plant.

— Minimize tropical weather-related damage by promoting an earlier harvest and possible prevention of seed sprouting.

— Hasten harvest to meet a delivery or pricing deadline.

— Provide late-season weed control and reduce the presence of moist weeding material in the grain.

Determining physiological maturity

Physiological maturity in grain sorghum is reached when a black layer appears on the sorghum kernels. This layer is visible at the base of the kernel following individual detachment from their outer glume. Mature seed will contain approximately 30 percent moisture. Sorghum seed change color and accumulate hard starch in a similar manner to maturing corn kernels. If you observe a considerable amount of green seed rather than red or brown mature seed, give the field more time to fully mature.

Seed at the top of the head will mature prior to those at the bottom of the head. Sorghum pollinates first at the top of the head and progresses steadily downward to the base of the panicle (or flower cluster) in six to nine days. On average, sorghum hybrids reach black layer at approximately 120 days after planting. Most sorghum hybrids reach 50 percent bloom about 75 days after planting, and another 45 days are required after pollination for the grain to reach physiological maturity.

In **Figure 1**, five kernels of sorghum have been removed from different locations on the seed head. Kernels 1, 2, 3, 4 and 5 were located in descending order down the seed head. The crop is considered mature when all the kernels look like kernels 1, 2 and 3. Kernels 1 and 2 have a fully developed black layer, and kernel 3 has a black layer that has formed. Kernels 4 and 5 show almost no formation of a black layer. Hard starch initially forms at the seed crown and progressively moves toward the base, where it develops a black layer similar to corn. Pinch a seed between your fingernails, and if you easily penetrate soft dough at the base of the seed, it is not mature.

Figure 1. Sorghum kernels in various stages of maturity harvested from the same panicle from the most mature (1) to the least mature (5). The black layer is first visible in kernel 3 and becomes more distinguishable as the seed loses moisture.


Grain sorghum harvest.

Do not apply a harvest aid prematurely (before physiological maturity) because you will sacrifice yield and test weight by hastening seed fill. About 25 percent of seed weight is added during the last 14 days prior to physiological maturity. Therefore, it is extremely important to scout the entire sorghum field and properly determine physiological maturity before applying a harvest aid.

Harvest aid products

Three products are labeled for use as harvest aids: sodium chlorate, glyphosate and carfentrazone. Good spray coverage is essential for all three products.

Sodium chlorate: Provides leaf desiccation but does not kill the plant. Regrowth may occur. Apply 7 to 10 days prior to harvest. Rates are based on product formulation. If a 6 lb/gallon sodium chlorate is used, apply 1 gallon of product per acre and adjust rates accordingly for different formulations.

Use the lower rate when grain moisture is low and weather conditions are conducive to drying. Use the higher rate when conditions for desiccation are poor.

This product may be applied by aircraft (4 to 10 gallons per acre) or ground (10 to 20 gallons per acre). It is essential that the foliage be thoroughly covered. This product should not be mixed with insecticides or other organic materials unless specifically labelled because a fire or explosion may result. Apply as a medium or coarser spray.

Desiccation is favored on clear, calm, sunny days with high temperatures and high humidity. If rain is anticipated within 24 hours, application should be delayed. Desiccation may be slowed when daytime temperatures are below 60 degrees Fahrenheit.

Glyphosate: Apply up to 44 fluid ounces per acre after sorghum has reached 30 percent moisture or less. Use a spray volume of 10 to 20 gallons of water per acre for ground application, or 3 to 10 gallons of water for aerial application.

As with other herbicides that result in plant death, avoid preharvest application to plants infected with charcoal rot, as lodging may occur. Allow a minimum of seven days between application and harvest. Also, glyphosate is a late-season weed control option.

Rainfastness can vary based on glyphosate formulation; however, six hours is sufficient time for absorption by the leaves.

Carfentrazone: The product label emphasizes to use it as a weed desiccant rather than for crop dry-down. It provides excellent control of morning glory. Apply at 1 ounce per acre and use a minimum of 10 gallons of finished product per acre for ground application and 5 gallons per acre for aerial application.

The time required between application and rainfast is one hour, and there is a preharvest interval of three days. Tank-mixing sodium chlorate with carfentrazone offers desiccation of grass weeds.

This information is provided as a guide only. Always consult the product label or manufacturer for complete information.

Crop lodging

Healthy sorghum plants usually do not lodge after a harvest aid is applied and are capable of standing for up to three weeks after treatment. After 30 days, lodging can be significant. It is a good idea to apply harvest aids to only the fields that can be harvested within 14 days of application.

Charcoal rot can cause premature lodging; therefore, it is a good idea to inspect fields before an application is made. Infected plants die prematurely before grain fill is completed (**Figure 2**). Visual inspection of plants before applying a harvest aid requires splitting the stalk lengthwise. Infected stalks will be soft, spongy or disintegrated at the crown with charcoal-colored specks, which are fungal reproductive structures. If the stalk is unhealthy, plants will generally fall regardless of treatment. **Figure 3** provides the visual symptomology when charcoal rot is present. §

Figure 2. Infected plants die prematurely before all grain can be filled. Upon closer inspection, many sorghum heads will appear dull and lackluster, and the spikelets may droop, giving the panicle a ragged appearance. Panicles will contain shriveled grain, with the worst being found at the base of the sorghum head, which would have been the last grain to mature. PHOTOS ON THIS PAGE BY TOM ISAKEIT, TEXAS A&M UNIVERSITY

Figure 3. By the time sorghum begins to lodge, it may be too late to apply glyphosate. When sliced open, the lower 5 to 6 inches of the stalk will be soft, spongy or disintegrated with charcoal-colored specks, which are reproductive structures of the pathogen. As prematurely killed plants continue to lose moisture, the plants will fall rapidly under the weight of their own grain.

Guidelines for applying cotton harvest aids

BY DAN FROMME, DANIEL STEPHENSON AND DONNIE MILLER

One of the last steps in managing a cotton crop is harvest preparation. Successful harvest preparation includes scheduling for defoliation and harvest operations, removal of foliage and facilitating boll opening. Successful defoliation has many benefits, including increased picker efficiency, elimination of trash in harvested seed cotton and faster drying of dew, which increases picking hours per day.

There is always a balancing act between yield and fiber quality when defoliating cotton, but paying close attention to individual fields can help maintain quality while preserving yield. There are several accepted methods for timing defoliation, and all methods have strengths and weaknesses. The following is a refresher on two of the more common defoliation timing techniques.

Method 1: Percentage of open bolls

The most widely used method is based on the total percentage of bolls in a field that have opened, with 60 percent of bolls open being the most commonly recommended point to apply a harvest aid. In many situations, unopened bolls are mature enough to resist negative effects and will open before harvest.

Based on research conducted in Louisiana, this method has limitations in certain situations. Depending on fruit distribution on the plant, maximum yield can be obtained when defoliation occurs before 60 percent open bolls. In addition, in cases where a large fruiting "gap" (no bolls present at fruiting sites) occurs and a large percentage of bolls are less mature and set in the uppermost region of the plant, optimum defoliation timing may occur later than 70 percent open.

Research has shown maximum yield can be achieved by applying a harvest aid ranging from 42 to 81 percent open bolls, depending on crop maturity and fruit distribution.

Method 2: Nodes above cracked boll

The nodes above cracked boll (NACB) method focuses on the unopened portion of the crop. The nodes above cracked boll measurement is determined by locating the uppermost first-position boll that is cracked with visible lint, then counting the number of main-stem nodes to the uppermost harvestable boll (**Figure 1**).

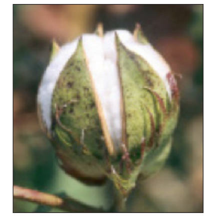

Figure 1.

By focusing on the unopened portion, NACB takes into account potential fruiting gaps. Most recommendations call for defoliation at four NACB. Low plant populations and skip-row cotton, however, often are more safely defoliated at three NACB. Lower plant populations usually mean a later-maturing crop, with a significant portion of yield coming from outer-position bolls and bolls set on vegetative branches. In some situations, defoliating when there are more than four nodes above the cracked boll can result in yield loss.

Visual inspection

Whatever method is employed, growers should visually inspect unopened bolls for maturity. A boll is considered mature if it is difficult to slice in cross-section with a knife and its seeds have begun to form a tan, brown or black seed coat. Once a dark seed coat has formed, defoliation will not adversely affect yield of those bolls (**Figure 2**). Depending on temperature, cotton bolls need 40 to 60 days to mature.

Figure 2. Seed coats darken as cotton bolls mature. The leftmost boll is immature, while the one at far right is fully mature. PHOTO BY NATIONAL COTTON COUNCIL

Bolls set later in the season will take longer to mature and may never be harvestable. Growers should walk their fields before defoliation and examine only those bolls that can reasonably be expected to mature.

Additional information

Research in Louisiana has shown that, on average, cotton is harvested from a 12- to 14-node range on the plant. This fact can serve as a tool to simplify identifying the last harvestable boll as well as timing of defoliation. To use the 12-node rule, identify the lowest first-postion boll that is expected to be harvested. Count up 12 nodes on the plant. The boll present at that position is likely to contribute to yield. Under some circumstances, a boll on the 14th node from the bottom could be considered harvestable. Bolls produced above that position on the plant are unlikely to contribute to yield. Waiting on them to mature puts heavier bolls at the bottom of the plant at risk of unnecessary weather-related losses. Once the last harvestable boll has been identified, use the visual inspection technique to determine when it is mature and ready for defoliation.

Environmental conditions

Weather conditions are an important factor to consider when applying a harvest aid. Weather factors that impact defoliation efficiency are temperature, sunlight, relative humidity, drought stress and the occurrence of rainfall shortly after application. Minimum temperatures for activity of various harvest aids have been determined. In general, desicants remain active at lower temperatures than defoliants, and contact-type defoliants remain active at lower temperatures than materials with hormonal activity.

Selection of a harvest aid and expected activity depends on the condition of the crop. No single harvest aid alone can give you excellent control if your goal is to remove mature leaves and juvenile growth, suppress regrowth and open bolls.

See **Table 1** below for more information. §

Table 1. Expected activity of various harvest aids.

MATERIAL	ESTIMATED MINIMUM TEMPERATURE (F)	EXPECTED ACTIVITY				
		Rain-free period (hours)[1]	Mature leaves	Juvenile growth	Regrowth prevention	Boll opening
Folex 6 EC	60	1	Excellent	Fair	Poor	None
Thidiazuron	65	24	Excellent	Excellent	Excellent	None
Ginstar EC	60	12	Excellent	Excellent	Excellent	None
Aim EC	55	8	Good/excellent	Excellent	Poor	None
ET	55	1	Good/excellent	Excellent	Poor	None
Display	55	8	Good/excellent	Excellent	Poor	None
Sharpen	55	1	Good/excellent	Excellent	Poor	None
Ethephon	60	6	Fair	Poor	Poor	Excellent
Finish 6 Pro	60	6	Excellent	Poor	Poor	Excellent
Glyphosate[2]	55	4	Fair	Fair	Excellent	None
Paraquat	55	30 minutes	Dessication	Excellent	Poor	Fair
Sodium chlorate	55	24	Fair	Fair	Poor	None

[1]Expected rain-free periods are estimates only and may not be exact. Other conditions, including temperature, moisture and crop status, will play a role in product performance.

[2]Non-glyphosate tolerant or conventional varieties.

Guava root-knot nematode found in La.

BY ROGERS LEONARD

A new nematode has been found in Louisiana. Presently, this pest has only been found in one part of one field in the very northern part of Morehouse Parish. It has not been found at any other site in Louisiana.

The Louisiana Department of Agriculture and Forestry has a protocol in place to restrict further movement from the site. The nematode survey lab in the LSU AgCenter Department of Plant Pathology and Crop Physiology has been analyzing samples for years, and this is the first verified report. There is no immediate danger to our Louisiana crops at this time.

There are some inconsistencies in the reports being released. Here is some additional information for clarification.

— This species is not the more common root-knot nematode, *Meloidogyne incognita*, that has been affecting Louisiana crops for years. The correct name for the invasive species is the guava root-knot nematode, *Melloidgyne enterolobii*.

— Identification and species separation is complex and time consuming.

— This pest has already been documented in Florida since 2001 and North Carolina since 2011. It is not new to the U.S.

— Probable modes of distribution are through nursery stock and soil movement.

— Although soybeans, sugarcane and horticultural crops are listed as hosts, there is limited information on detrimental effects on these crops and non-crop hosts in the U.S.

— The AgCenter will continue its statewide surveys on nematode samples and will monitor the single infestation site of the guava root-knot nematode. §

Insect pressure is up

BY SEBE BROWN

Cotton

Since the last newsletter, insect pressure in Louisiana cotton has increased across much of the state. For the past three weeks, many producers have faced a slow but steady bollworm moth flight that has transitioned into an exaggerated egg lay. Fortunately, this type of worm activity has not put the selection pressure on our Bt technology that we experienced last year.

Based on small-plot research conducted at the Macon Ridge Research Station, all of the technologies are performing better this year than last year. Results from our Bt technology tests indicate Bollgard 2 varieties are experiencing an average of 2.5 percent fruit injury, Bollgard 3 varieties are experiencing an average 3 percent fruit injury and both Widestrike and Widestrike 3 varieties are experiencing 4 percent fruit injury. TwinLink and TwinLink Plus are experiencing 5 percent and 3 percent fruit injury, respectively. Keep in mind that these results are from one location, and results from your farm may be different. The fruit injury threshold for Louisiana cotton is 6 percent with the presence of live worms. However, this threshold may not work in every situation or for every Bt technology.

Overall, this is good news for Louisiana cotton producers and signals that our Bt technology may still have some life left in it. Be aware that this situation can change quickly, and bollworm escapes can and will happen in all technologies. Scouting is important, and under light pressure, our Bt technology is appearing to hold. But if pressure intensifies, a rescue spray may be necessary.

If a rescue spray is warranted, the best options from our foliar trials indicate that 10.0 oz/acre of Besiege or 20.0 oz/acre of Prevathon will provide the greatest control of bollworms. Keep in mind that bollworms are cryptic feeders, and worms that have established in squares and bolls may not be controlled by diamides.

Soybeans

Dectes stem borer infestations are beginning to materialize across much of Louisiana's soybeans. Dectes stem borers are small gray longhorn beetles that lay their eggs in the petioles of soybeans. Once hatched, the larvae feed inside the soybean petiole and tunnel their way into the stem. After the larvae vacates the petiole, the petiole will turn a gray color, wilt and die. This is the primary symptom most often observed from Dectes infestations.

Dectes stem borer infestations rarely cause significant yield losses to healthy soybeans. Borer larvae, in some instances, can cause lodging. This is due to the larvae burrowing down the soybean stalk in preparation for overwintering. Timely harvest is effective at reducing yield losses associated with lodged soybeans. Insecticidal control methods are often impractical and not economically feasible. This insect spends almost its entire life inside soybean stems, which protects it from traditional chemical control. Targeting the adult is very difficult due to its summer-long activity, and systemic insecticides provide virtually no control of larvae once inside the stalk.

The vast majority of soybean fields in Louisiana will not incur damage from Dectes stem borers, and chemical controls are often not warranted or effective in controlling their populations. §

Watch for target spot, other cotton diseases

BY TREY PRICE AND BOYD PADGETT

Target spot

In the past week, a few calls and text messages have been received concerning target spot. Overall incidence and severity seem to be very low.

Target spot, caused by *Corynespora cassiicola*, starts on the lowest leaves in the canopy, and "fresh" lesions appear as pencil eraser- to dime-sized, water soaked, green to gray, circular lesions (**Figure 1**). Centers of lesions later become tan to brown and have a distinct bullseye appearance as the disease progresses upward (**Figure 2**). Lesions in the lowest part of the canopy usually will not have reddish margins. Reddish margins may develop around lesions in the mid- to upper canopy in severe cases.

Figure 1, left. Early symptoms of target spot.
Figure 2, right. Characteristic target-like lesions of target spot.

Target spot can significantly defoliate cotton over a short period of time under optimal environmental conditions (warm, long dew periods, rainy). Disease intensity increases with the frequency of rainfall events, while hot and dry weather similar to what we are currently experiencing will usually keep target spot in check. Any cotton variety that develops rank growth is susceptible to target spot, which makes canopy management a factor in managing the disease. Excessive nitrogen application may increase the risk of target spot by increasing the risk of rank growth.

Small-plot research trials since 2014 at the Northeast, Macon Ridge and Dean Lee research stations indicate that fungicide applications during the first month of blooming may significantly reduce defoliation due to target spot. However, statistically significant (90-percent confidence level) yield preservation has not been observed in any of the trials to date. Trends towards yield preservation have been observed under severe disease pressure (greater than 60 percent defoliation). The highest defoliation that has been observed to this point is five percent. This is encouraging, as we are close to the end of July!

We have also noticed many fields with white blooms in the top of the canopy, indicating the crop is pretty far along. If the weather changes and fungicide applications are warranted in later-planted cotton, applying by air will likely not result in the desired coverage. Application by ground using flat fan or hollow cone tips at a minimum of 15 GPA are preferred to achieve the necessary coverage. Applications after significant defoliation has occurred are unlikely to provide economic benefit.

Cotton leaf spot complex

Figure 3. K deficiency and CLSC.

The cotton leaf spot complex (CLSC), which does not include target spot, is caused by several different species of fungi. This disease complex has become common in Louisiana cotton. Most often, CLSC is associated with potassium (K) deficiency and drought stress (**Figure 3**). Also, any type of crop injury (herbicide, fertilizer, etc.) may exacerbate CLSC. Fungicide applications are effective on CLSC; however, they are not recommended because economic benefit is unlikely. It is best to solve the underlying issue, which is usually a K deficiency. Test your soil and apply nutrients as appropriate. Very limited data exists on in-season foliar applications of potassium and the effect on CLSC.

Bacterial leaf blight

Reports of bacterial leaf blight (BLB) have been scarce this year in Louisiana cotton, which is likely due to an unfavorable environment for disease development. Initial infection through wounds and natural openings in leaves produces dark green, angular, water-soaked spots. However, most of the time BLB is not noticed until lesions are reddish-brown, possibly with yellow halos (**Figure 4**). The bacterium may infect all cotton plant parts, but is most commonly observed on leaves, and infection of leaf veins may occur creating a characteristic appearance (**Figure 5**).

Sometimes BLB may be confused with target spot. It is possible that a secondary fungal pathogen may invade after initial infection by the bacterium. Notice the dark, angular center in the lesion in **Figure 6**.

The bacterium that causes BLB may be seedborne or overwinter in cotton debris. Ensuring that sanitary measures have been taken by the seed company prior to purchasing seed is recommended. Tillage may reduce inoculum the following spring if you are following cotton with cotton. Rotation to a field where cotton was not the previous crop will reduce the chances of BLB occurring. Overhead irrigation and excessive rainfall may increase disease incidence and severity. Varieties that are resistant to BLB are commercially available and are the best management option. We have yet to see significant losses due to BLB in Louisiana.

Please refer to the Plant Disease Management Guide for more information. §

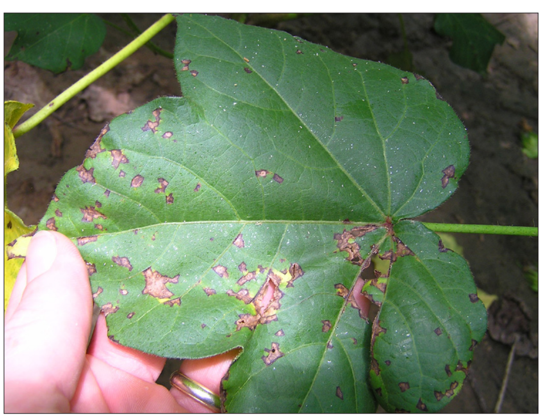

Figure 4, above. Angular lesions of BLB.
Figure 5, right. Vein infections characteristic of BLB.
Figure 6, far right. Yellow halos surrounding BLB lesions that mimic target spot.

EPA updates Worker Protection Standard rule

BY KIMBERLY POPE BROWN

The Environmental Protection Agency (EPA) Agricultural Worker Protection Standard (WPS) is aimed at reducing the risk of pesticide poisoning and injury among agricultural workers and pesticide handlers. The EPA has made major revisions to the Worker Protection Standard (WPS), and the LSU AgCenter has worked to provide an updated WPS train-the-trainer program that has been approved by the EPA. The final rule is posted here.

In Louisiana, employers who want to train their own workers and handlers must be a certified applicator and go through the new WPS train-the-trainer program with the AgCenter. All workers and handlers must now be trained on an annual basis. If you went through a WPS train-the-trainer program prior to November 2016, you will have to attend a new program. Once you have completed that program, "WPS trainer" will go back on your pesticide license and you will then be able to go to your normal recertification meeting to have that category recertified.

There are a few things that need to be pointed out about the revised rule:

Workers and handlers must be trained every 12 months.

WPS trainers must go through the new EPA-approved train-the-trainer program.

Workers and handlers must be trained by using EPA-approved training materials.

The card system is no longer used to record training. You must maintain the following information:

— Trained worker's printed name and signature.

— Date of the training.

— Which EPA-approved materials were used.

— The trainer's name and qualification to train.

— The worker or handler employer's name.

Email kbrown@agcenter.lsu.edu to request a training verification form for WPS.

You must retain records of training of workers and handlers for two years.

Keep this information at a central location:

— New safety poster, available here.

— Application records.

— Emergency medical contact information.

— SDS (safety information).

When using a pesticide that requires a respirator, employers must:

— Have employees evaluated by a physician or other licensed healthcare professional.

— Have employees go through an annual fit test for each type of respirator required by the pesticide product label.

— Annually train employees on how to properly use the respirators.

— Maintain records for two years of the completion of the above requirements.

The "How to Comply" manual is a great reference guide and can be ordered at npsecstore.com. EPA-approved training materials are available at pesticideresources.org. Additional information is available at www.lsuagcenter.com/pesticide. §

Upcoming trainings

To participate in these WPS train-the-trainer programs, email kbrown@agcenter.lsu.edu.

Aug. 16, Sweet Potato Research Station
130 Sweet Potato Road, Chase
1 to 3 p.m.

Aug. 17, Rapides Parish office
300 Grady Britt Drive, Alexandria
1:30 to 4 p.m.

LSU AGCENTER SPECIALISTS

SPECIALTY	CROP RESPONSIBILITIES	NAME	PHONE	EMAIL
Corn, cotton, grain sorghum	Agronomic	Dan Fromme	318-880-8079	DFromme@agcenter.lsu.edu
Cotton	Agronomic	Dan Fromme	318-880-8079	DFromme@agcenter.lsu.edu
Grain sorghum	Agronomic	Dan Fromme	318-880-8079	DFromme@agcenter.lsu.edu
Soybeans	Agronomic	Todd Spivey	919-725-1359	TSpivey@agcenter.lsu.edu
Wheat	Agronomic	Boyd Padgett	318-614-4354	BPadgett@agcenter.lsu.edu
Pathology	Cotton, grain sorghum, soybeans	Boyd Padgett	318-614-4354	BPadgett@agcenter.lsu.edu
Pathology	Corn, cotton, grain sorghum, soybeans, wheat	Trey Price	318-235-9805	PPrice@agcenter.lsu.edu
Entomology	Corn, cotton, grain sorghum, soybeans, wheat	Sebe Brown	318-498-1283	SBrown@agcenter.lsu.edu
Weed science	Corn, cotton, grain sorghum, soybeans	Daniel Stephenson	318-308-7225	DStephenson@agcenter.lsu.edu
Nematodes	Agronomic	Charlie Overstreet	225-578-2186	COverstreet@agcenter.lsu.edu
Irrigation	Corn, cotton, grain sorghum, soybeans	Stacia Davis Conger	904-891-1103	SDavis@agcenter.lsu.edu
Ag economics	Cotton, feed grains, soybeans	Kurt Guidry	225-578-3282	KMGuidry@agcenter.lsu.edu

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www.louisianacrops.com

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