LOUISIANA CROPS NEWSLETTER

Cotton, Corn, Soybeans, Sorghum, and Wheat

LSU AgCenter Research & Extension

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Avoid nematode damage to cotton and soybeans in 2015

By Charles Overstreet, Extension Nematologist

Louisiana has historically experienced losses due to plant-parasitic nematodes in cotton and soybean every year. Some years these losses can be severe and other years fairly minor. The greatest losses occur in years where additional stresses occur during the growing season and drought being a primary contributor.

The two major nematodes of both cotton and soybean are the Southern root-knot and reniform nematodes. Southern root-knot nematode is the generally restricted to coarse-textured soils such as sandy loams and some of the silt loams. I see damage from this nematode every year regardless of moisture in the soils but can really see severe damage late season during drought periods. Reniform nematode is not very particular about soils and can be found in both coarse and fine-textured soils. The reniform nematode seems to be much more associated with stress and causes the greatest amount of injury in years where there is drought during the growing season.

If producers have been conducting a good rotation program, nematode injury may be greatly reduced. Corn and grain sorghum as well as some soybean varieties are great rotation crops to use against the reniform nematode. Usually, one or two years in these crops can reduce numbers sufficiently that serious losses can be avoided. The major problem we have with root-knot nematode is that just about everything we plant is susceptible. Corn, grain sorghum, cotton, and most soybean varieties are considered to be fairly good hosts for southern root-knot nematode.

Producers should base their management decisions on several factors. First, what types of nematodes are present in your fields? Reniform and Southern root-knot may be dominant nematodes in a field or both types can be present. Both types being present in a field is much more common today that in the past. The type of rotation that has been used could have effectively reduced population or shift populations from one type of nematode to the other. Usually, the greatest damage occurs when a susceptible crop such as cotton or soybean are planted consecutively for several years.

Resistant varieties are always good options since they can reduce serious losses and usually help lower nematode populations. As I indicated in the last newsletter, we have six varieties of soybean with some level of resistance against root-knot and with the exception of MPG 5214NRR soybean, a different set with resistance against the reniform nematode. This is where it becomes important to know the dominant nematode that you are dealing with in your fields. There are a few cotton varieties such as Deltapine 1454 NR B2RF and 1558 NR B2RF and Stoneville 4946 GLB2 that can be helpful when root-knot nematode is a problem. Currently, there are not any varieties with specific resistance against the reniform nematode.

Producers with nematode problems in cotton should at least consider using seed treatment nematicides. Avicta Complete Cotton, Avicta Duo Cotton, Poncho Votivo, AERIS Seed Applied System, and Acceleron Seed Treatment Products should be used when low to moderate levels of nematodes are present. Higher levels may require additional treatment such as the fumigant Telone. Telone is best used in a site-specific manner where it is applied only to the areas of a field where it is needed. Vydate can also be used to supplement nematode management if it will fit into your insect management program. A new nematicide ILeVO from Bayer Crop Science is now labeled for use in both soybeans and cotton and will be widely available in 2016. This product will greatly extend our options for treating fields with higher levels of nematodes.

Treated with a fumigant (Telone) on the right and untreated on the left. Field has high levels of both root-knot and reniform nematode.

Challenges with N management with moisture weather conditions

Josh Lofton and Beatrix Haggard, LSU AgCenter

The 2015 corn season has started off very challenging for the majority of the state. Much of the corn that has been planted was planted later within the optimum window, while several producers are still trying to decide on whether to plant the final intended acres (A great article about late-planted corn was recently published by Dr. Erick Larson at MSU http://www.mississippi-crops.com/2015/04/07/are-we-going-to-get-this-corn-crop-planted/). While corn that was planted on time is up and most has a pretty good stand, new challenges are arising with N fertilization in the wet conditions around the state. Much of this corn is between the V2 to V6 leaf stage and has good growth. However, only a limited number of acres have had any measureable N applied. This has increased interest in aerial application of part or all of the intended fertilizer as urea. While these applications have the potential to be very beneficial and common – especially in the delta of Mississippi on high clay ground, according to Dr. Bobby Golden at MSU – correct decisions and appropriate management are needed to get the most benefit.

The first thing that needs to be decided is whether the crop needs this shot of fertilizer or if it can be delayed until the ground applicator is suitable. Aerial application will be more costly per acre than ground applications. The best way to determine if the crop needs this application will be the crop itself. Symptoms of N deficiency are an overall pale crop and shortened growth. However, these symptoms are also associated with cold and/or wet conditions. While poorly drained soils and N deficiencies can be highly associated with each other, field pattern can be a way to determine if the crop as a whole is stressed or just low areas (i.e., is the short, pale corn in a localized area or across the field).

Once areas have been identified as not just localized areas of poor drainage, other issues must be addressed. One such issue is whether the crop is suffering from an N or S deficiency. These two are often confused with the other. Typically, location on the plant can be used to gauge whether N or S is the most likely culprit, with N traditionally being on lower, older growth and S being on the new growth. However, in young, developing plants these traditional deficiency locations are not 100 percent. While determining if an N or S deficiency is present is critical, often these two will probably be present in most Louisiana systems. Additionally, if no S has been put out, then managing for both N and S will probably be necessary, especially if substantial time will pass before successive fertilizer applications.

The next factor that needs to be determined is how much N to apply. This decision will be entirely based on the farm operation. There are pros and cons for both urea and UAN, but both can be used to produce optimum growth and productivity. In this regard, producers can apply their entire intended N applications as urea aerially. Though expensive, this provides the luxury of not having to fit in another application when drier conditions arrive (especially as further planting of grain sorghum, soybeans and cotton are probably also intended). On the other hand, if UAN has been purchased and is the intended fertilizer for the majority of the N management, a smaller application can be applied as urea to provide some flexibility until drier conditions exist. These applications should include at least 50 to 100 lbs of N per acre (as urea and ammonium sulfate) and anywhere from 10 to 20 lbs of S per acre (as ammonium sulfate). This ensures adequate N and S for the stressed crop. However, if making these applications, it is important to readjust further N application to account for this additional application. Additionally, splitting N applications into a couple smaller applications can minimize N losses associated with the current adverse environmental conditions being experienced.

The final management decision that should be made is whether or not to treat the aerially applied urea or not. This decision often comes down to economics rather than agronomics. From an N management perspective, the application of urease inhibitors (NBPT) on aerial applied (without incorporation) should be the standard. This is due to the fact that up to 50 percent of applied urea can be lost through volatilization if the conditions are unfavorable. Furthermore, the application of a nitrification inhibitor (DCD or nitrapyrin) may also be warranted, but this has little to do with the application and environmental conditions now and more to do with soils and environmental conditions that will be experienced in the upcoming season. Further details are provided in the following link: http://louisianacrops.com/2015/04/06/choosing-to-use-n-inhibitors-or-not-in-mid-south-corn/.

Even though this corn season has had a challenging start, overall this current crop that has been planted shows promise. Therefore, management decisions should be taken that will help maintain this potential. However, with current prices, inputs must be warranted prior to application r to ensure return on the investment. Therefore, producers must watch their crop and weather on these applications. For further questions or comments feel free to contact:

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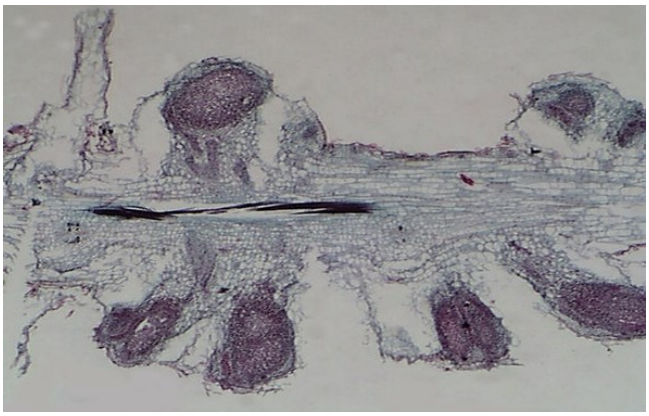
Soybean Planting Delayed

Wet conditions throughout the state continue to delay planting. Soybean planting got started early this year with a few acres planted the first of April. As planting slowly started to progressed, rain began to become the big question. The May floods that we typically fear came early. Most of the state, received some rain the first of April then major rains crossed the state twice a week leaving most fields to wet to plant. As fields were close to planting another major rain would cross the state. Wet soils continue to hamper producers trying to get the crop planted during the optimum time. While soils have been wet, warm conditions have benefited the soybeans that have been planted resulting in quick emergence. Its time for some dry weather, at least til we get everything planted!

Louisiana was projected to increase planting soybeans in 2015. Strong exports and demand for soybeans continue and soybean acres may continue to increase throughout the planting season. The acre planted will probably be limited by weather. If the weather will allow the planting, we could see up to 1.5+ million acres planted to soybeans. Each year seems to present different problems for production, hopefully this will be our only one. For information on crop production contact your local County Extension Agent

Soybean Inoculation



Soybeans are big users of nitrogen, removing about four pounds of nitrogen per bushel. Soybeans that are poorly nodulated will have to take up most of the nitrogen they need from the soil. Since nitrogen fertilizer is generally not applied to soybeans, a crop that is poorly nodulated will quickly use up the available nitrogen in the soil and become chlorotic from nitrogen deficiency.

Soybean inoculant contains *Bradyrhizobium japonicum* bacteria. The Bradyrhizobium bacteria forms nodules on soybean roots and these nodules fix nitrogen from the atmosphere and supply it to the plants. For nitrogen fixation to occur, the nitrogen-fixing bacteria need to be readily available in the soil or must be applied to the seed or soil. When the seed germinates, the bacteria invade the root hairs of the seedling and begin to multiply forming nodules on soybean roots. Nodules, which house the bacteria, can be seen shortly after emergence but active nitrogen fixation does not begin until about the V2 stage. After this, the number of nodules formed and the amount of nitrogen fixed increase with time until about R5.5 (midway between R5 and R6), when they decrease sharply. There is a mutual benefit in the relationship between the *Bradyrhizobium* bacteria and the soybean plant. The plant, in turn, provides the bacteria's carbohydrate supply. A relationship such as this, where both bacteria and plant profit from the other, is called a symbiotic relationship.

If soybeans have been grown on the field in previous years, there may be enough Bradyrhizobium bacteria in the soil to nodulate the soybeans adequately. In that case, an inoculant may not benefit the crop. But if there is not enough Bradyrhizobium in the soil, the inoculant may increase yields by two bushels per acre or more on fields that have had soybeans in the recent past. On fields where soybeans have never been grown, the inoculant has been shown to increase yields by 10 bushels per acre or more.

Soybeans inoculation should be considered for the following circumstances:

--Where the field has not been planted to soybeans for the past three to four years or more;

--Where the soil pH is less than 5.5 or greater than 8.5;

--Where soil organic matter levels are less than one percent; and/or

--Where there has been severe drought or flooded conditions (rice rotation).

There may be several causes of poor nodulation and inoculation failure, including: poor quality inoculant; poor storage and handling; or poor seed coverage with inoculants. Most fungicide seed treatments should not harm the inoculant if applied according to directions, but be sure to check the label of the specific fungicide seed treatment to be used. If you have questions concerning inoculation contact your local County Extension Service Agent.

Corn Growth and Development

Dan Fromme
State Corn/Cotton Specialist
LSU AgCenter

Corn growth and development is closely related to temperature. Warmer temperatures mean faster corn growth and cooler temperatures mean slower corn development.

Temperatures are used to calculate growing degree days (GDD) or some people call them heat units (HU). Several formulas exist to calculate these GDD, but the one used most often is the "Modified 86/50 Cutoff Method" (MGDD).

MGDD for any given day are calculated by subtracting 50 from the average daily temperature. The average daily temperature is calculated by adding the daily high and the daily low temperatures and then dividing by two.

$$GDD = \frac{\text{Max. Temp + Min. Temp.}}{2} - 50F$$

Two criteria or rules exist when calculating MGDD. First, if the daily high was greater than 86F, then 86F is used to calculate the average. Second, if the daily low was less than 50F, then 50F is used to calculate the average. These upper and lower temperature thresholds or limits define the boundaries beyond which corn develops very slowly, if at all.

Throughout the years, we have talked about the number of MGDD accumulation when silking or physiological maturity (black layer) occurs. For example, a particular hybrid will silk at 1400 MGDD or reach physiological maturity at 2700 MGDD.

Another useful purpose for following MGDD accumulation is to track the rate of leaf development prior to pollination. From V1 to V10, new leaves (defined by the appearance of leaf collars) emerge at a rate of about 85 MGDD per leaf. This is equivalent to about one leaf every five to six days in early April. From V10 to the final leaf, leaves emerge at a rate of about 50 MGDD per leaf.

Practical uses of this information include estimating how far along the corn crop should be for any given location if we know the planting date and the MGDD accumulations since the planting date. It is especially important to know the emergence date, but if this is not available we can use 125 MGDD from planting to emergence if the actual date is not known.

For instance, corn should reach the V6 growth stage by the time 635 MGDD have accumulated since planting. This is calculated by using 125 MGDD from planting to emergence, then figuring 510 MGDD (6 x 85) from emergence to V6.

Also, let us utilize this information to compare predicted leaf development for three different years. These values in the table represent actual accumulated MGDD from the emergence dates (March 1 and March 15) and the predicted leaf stage as of April 19 for each year. Remember, warmer temperatures mean faster corn development.

Table 1. Estimates of leaf stage development for March 1st and March 15th emergence dates for three different years. Source: Dean Lee Research and Extension Center, Alexandria, LA.

	April 19, 2015		April 19, 2014		April 19, 2012	
Emergence Date	Accum. MGDD	Est. Leaf Stage	Accum. MGDD	Est. Leaf Stage	Accum. MGDD	Est. Leaf Stage
March 1	772	9	466	5	932	11
March 15	673	8	391	4	732	9

It is very important to remember that a shortage of MGDD resulting from early season cool temperatures can really never be recovered. Mid-summer days in the 90s do not necessarily accelerate MGDD accumulations because rate of growth is minimal when temperatures are above 86F.

Also, plant stress (soil compaction, excessive soil moisture, pest injury, hail damage) can interfere with this relationship and retard leaf development. Comparisons of predicted leaf development stages with actual leaf stages can therefore be used as an indicator of plant stress.

Corn that was planted this year at the Dean Lee Research and Extension on March 20th is currently at the four leaf stage (as of April 20th). Utilizing the information in the above paragraphs, we should be at the five leave stage or five-six days farther along in growth. Possible reasons for this delay in crop growth could be excess soil moisture conditions since planting.

Consider improving irrigation management and scheduling practices before the dry season

By Stacia L. Davis, Ph.D.

Though it's difficult to focus on irrigation with the considerable amount of rainfall occurring now, this is the perfect time to address improvements to your current irrigation management practices. Proper irrigation scheduling – knowing when to pull the trigger - is extremely important to maximize yield and profits. Irrigating too much will negatively impact the crop due to leached nutrients, erosion, and creating surface runoff that carry pesticides, herbicides, and fertilizers off the field. Limiting over-irrigation has the potential to address concerns over diminishing water resources, increasing environmental regulation, and rising costs of irrigating crops.

Maintenance and installation recommendations are based on the type of irrigation delivery system. For furrow irrigation, consider running PHAUCET or Pipe Planner (Delta Plastics, Little Rock, AR) to select the hole sizes that should be punched into the lay-flat tubing. Selecting the proper hole sizes allows for adequate pressure through the system and uniform watering along the furrows. Information such as the discharge flow rate from the riser and the elevations along the lay-flat tubing pad is required for an accurate design. For center pivot systems, the nozzle package should be checked for adequate application this season and that the entire system is in proper working condition. It is extremely important to verify electrical grounding on these systems prior to performing maintenance. Pumps associated with all systems should be tested for efficiency since energy is the most significant cost to irrigating.

Technologies have become a popular and more affordable method to assist producers in making irrigation decisions. Current available technologies for irrigation scheduling include weather-based scheduling systems and soil moisture sensors. Both technologies can provide valuable information concerning field conditions and, depending on the level of control given to the technology, can determine irrigation schedules such as when to start irrigating and how long it should run. In most situations, the use of smart technologies requires an integrated approach between the technology and the producer for overall efficient irrigation.

Selecting between weather and soil moisture technologies is primarily up to the preferences of the producer. Soil moisture sensors are generally small and can be cost effective, but measurements are typically taken from a single location and extrapolated to large areas. In situations of terrain restrictions or inconvenient sensor installation, a weather-based technology such as a full or partial weather station may be a better option since it can be installed away from the fields.

Surge valves are another technology that can improve efficiency in furrow-irrigated applications. This device is installed so that an irrigation set is split into two smaller sets. Irrigation is applied in relatively short cycles that alternate between the two sides. This allows time for the water to soak into the soil before another cycle occurs. Surge valves are best applied on fields with unusually long furrows and on soils with poor infiltration characteristics.

The Smart Technologies for Agricultural Management and Production (STAMP) program was established in 2014 to include research and extension activities concerning technologies in agriculture. For more information on irrigation technologies or STAMP, please contact Dr. Stacia Davis at sdavis@agcenter.lsu.edu or your local ANR extension agent.

Upcoming Calendar of Events

April 22, Wheat and Oat Field Day at the Macon Ridge Research Station, Winnsboro.

April 22, High Fence Deer Management Field Day at the Bob R. Jones-Idlewild Research Station, Clinton.

April 20-26, AgMagic, an agricultural awareness exhibit for youth at Parker Coliseum on the LSU campus, Baton Rouge.

April 28, Northeast Region Youth Field Day at the Sweet Potato Research Station, Chase.

April 28, Northwest Regional Beef and Forage Field Day at the Red River Research Station, Bossier City.

May 8, Master Gardener Appreciation Day at the Hammond Research Station, Hammond.

May 12, Southwest Region Youth Field Day at the Rice Research Station, Crowley.

May 13-16, AgMagic on the River, an agricultural awareness exhibit for youth at Docville Farms, Violet.

May 15, Nursery Industry Open House and Azalea Lecture at the Hammond Research Station, Hammond.

June 16, Hill Farm Poultry Field Day at the Hill Farm Research Station, Homer.

June 17, Northeast Research Station Pest and Crop Production Field Day, St. Joseph.

June 20, Garden Fest at the Botanic Gardens at Burden, Baton Rouge.

July 1, 106th Rice Research Station Field Day, Crowley.

July 9, Dean Lee Research and Extension Center Field Day, Alexandria.

July 15, Sugarcane Field Day at the Sugar Research Station, St. Gabriel.

Oct. 8, Landscape Horticulture Field Day at the Hammond Research Station, Hammond.

Oct. 15, Beef Cattle and Forage Field Day at the Dean Lee Research and Extension Center, Alexandria.

Oct. 22-Nov. 8, AgMagic, an agricultural awareness exhibit for youth at the State Fair, Shreveport.

For additional calendar information on LSU AgCenter Parish and Statewide events, visit our website at www.lsuagcenter.com/calendar

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Entomology	Soybean, Corn, Grain Sorghum, Sugarcane	Beuzelin, Julien	337-501-7087 (cell)	JBeuzelin@agcenter.lsu.edu
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