Louisiana Crops newsletter, April 2020

Corn nutrient deficiency symptoms

By Dan Fromme, LSU AgCenter corn specialist

Deficiencies are not always due to low amounts of nutrients in the soil. Factors such as poor root development, root damage, poor soil conditions (dry, waterlogged or compacted) and unfavorable weather or growing conditions can induce nutrient deficiency symptoms. When early-season growing conditions are cool and wet, deficiencies of nutrients such as phosphorus, zinc and sulfur can show up frequently in corn fields (**Figures 1, 2 and 3**).

Figure 1. Leaves of young phosphorus-deficient plants are bluish green and slightly narrowed, turning reddish-purple starting at the tips and along the edges. Photo by IPNI

Figure 2. Symptoms of zinc deficiency appear as yellow to white bleached bands on the lower part of leaves while the mid-vein margins and tip remain green. The deficiency is favored by high soil phosphorus, high pH, cool, wet soil and low organic matter. Photo by IPNI

Figure 3. Symptoms of sulfur deficiency causes stunted, slow-growing and yellow plants. Yellowing occurs between the veins especially in upper leaves. Photo by arkansas-crops.com

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Leaf collar method for determining the correct vegetative stage of corn

By Dan Fromme, LSU AgCenter corn specialist

Vegetative (V) stages are determined by the total number of leaves with visible collars, beginning with the first leaf. A collar is the off-white band at the base of the leaf blade, where it extends away from the stalk (**Figure 1**). Throughout the vegetative stage, a new leaf will appear approximately every three to five days.

As the season progresses, lower leaves will be lost. These leaves must be included in your leaf count, or development stage will be misidentified. For an accurate assessment of the leaf stage, the stalk must be split lengthwise (**Figure 2**).

Each leaf will be attached to a single node, and the nodes are visible as lines across the split stalk. The first four nodes are usually indistinguishable within the crown. The fifth node is less than one-quarter inch above the area that contains the first four nodes.

The node corresponding to the uppermost leaf with a visible collar defines the vegetative stage.

Figure 1. This photo shows a collar, which is the off-white band at the base of the leaf blade.

Figure 2. This corn stalk has been split lengthwise. Splitting the stalk is necessary to accurately assess the leaf stage.

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True armyworms in field crops and pastures

By Sebe Brown, LSU AgCenter entomologist

In the past two weeks, instances of true armyworms (TAW) in wheat, corn and pastures have increased across the state. TAW are similar in appearance and size to fall armyworm (FAW). TAW possess a mottled brown head capsule (**Figure 1**) while FAW have an inverted "Y" on their head capsule. TAW develop into six instars, with larval development taking roughly 20 days and generational turnover occurring in 30 days. This insect is not well adapted to hot temperatures, and survival decreases significantly when air temperature is above 86 degrees F. TAW prefer grass hosts but will feed on broadleaves. TAW primarily feed at night, making observation during the day difficult. Larva consume 80% of the total foliage required for development in the last three to five days as larva. Larva congregate at the base of plants and on the soil surface to avoid midday temperatures. There are several natural enemies of TAW in Louisiana field crops. Predacious insects, parasitoids and pathogens occasionally will control TAW populations before a foliar overspray is required (**Figure 2**).

TAW infesting Bt corn rarely causes economic injury, and Bt proteins available in field corn work very well controlling TAW. Non-Bt corn can experience significant injury from TAW, and fields should be scouted regularly to avoid defoliation. TAW can graze non-Bt corn to the ground; however, if the growing point is still beneath the soil (up to roughly V5), corn seedlings will recover quickly.

TAW can significantly injure wheat if worms are allowed to defoliate the flag leaf before soft dough or clip wheat heads at any stage. The LSU AgCenter threshold for TAW in wheat is when five worms per square foot are found and foliage loss is occurring.

In hayfields and pastures, TAW can cause significant injury to grass crops if left uncontrolled. TAW injury is identical to FAW, and routine scouting in the spring is recommended. The LSU AgCenter threshold is one worm per sweep.

Pyrethroid insecticides control TAW very well in corn, wheat and pastures. As a general rule, large worms are harder to control than small worms.

Figure 1. True armyworm head capsule.

Figure 2. Virus-infected true armyworm.

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Considerations for replanting soybeans

By LSU AgCenter soybean specialist David Moseley, weed scientist Josh Copes and plant pathologist Boyd Padgett

As of April 12, the USDA National Agricultural Statistics Service reports 15% of the soybean crop in Louisiana has been planted, with 6% of the crop emerged. The planting progress by the week ending on April 12 is ahead of last year's progress at 13%, and the average of the previous five year's progress of 14%. The 6% emergence is behind the reported emergence of 9% in 2019 but is ahead of the five-year average of 4%. The soil moisture has been reported to be a little dry in south Louisiana, adequate in central Louisiana and a little wet in north Louisiana. The precipitation over Easter weekend was heavy in some places in north Louisiana, and the temperatures have been cool following the weekend.

The available soybean varieties typically have a 90% germination rate, however sometimes adverse conditions can limit soybean emergence, even to the point where replanting may be necessary. Soybeans can germinate over a wide range of soil temperatures from a low of 50 degrees Fahrenheit. This is encouraging with the recent cool front that has moved into Louisiana this week.

Planting soybeans in early April is appealing for many different reasons, including more favorable harvest conditions, avoidance of late-season stink bug and soybean looper infestations, and potential for higher yields. However, early April in Louisiana is often characterized by wet weather and cool temperatures. The combination of these factors can limit soybean emergence. As we approach the optimum planting window of mid-April to mid-May, replanting due to cold and wet conditions is less likely. However, the risk of a heavy rain soon after planting can be very detrimental to emergence. A heavy rain can cause the soils to compact and possibly form a crust barrier on the soil surface. Broadleaf crops, including soybeans, emerge from the ground by epigeal emergence, where the hypocotyl (the stem under the cotyledons) forms a crook that pulls the cotyledons above the soil. Afterward, the hypocotyl straightens and the epicotyl (stem above the cotyledons) continues to elongate to grow leaves and flowers. Soil crusting can be detrimental to this type of emergence. Crusting is typical in silt loams to sandy soils where organic matter content is low. If the soil becomes too compacted or if a crust forms on the soil surface, the cotyledons and epicotyl can break off from the hypocotyl, thus detaching the growing point from the root system. With the growing point unattached, there will be no additional growth from the seedling. In addition, heavy rains soon after planting in clay soils can result in flooded fields or prolonged saturated conditions that will deplete soil oxygen which the seedling needs to survive, thus reducing soybean emergence.

Figure 1. Two soybean seedlings emerging with the crooked shape hypocotyl pulling the cotyledons above the soil surface.

Figure 2. Due to soil compaction or crusting, the cotyledons and epicotyl can break, leaving the growing point unattached.

The first planting for a planting date study at the Dean Lee Research Station was sown on March 19. The seeding rate was approximately 138,000 seeds per acre. The soybean seeds were planted 10 seeds per foot with 38-inch spacing between rows. Expecting an 85% germination rate, the final population was planned to be approximately 117,000 plants per acre, with eight to nine plants per foot surviving. The weather conditions at the time of planting were good. The average high temperature for the date of planting plus three days before was 80 degrees Fahrenheit with average low temperature of 57 degrees Fahrenheit. The actual average high temperature for the four days after planting was 78 degrees Fahrenheit with average low temperature of 58 degrees Fahrenheit. At the time of planting, the previous and forecasted temperature was suitable for planting soybeans. However, the amount of rainfall over the three days after planting caused germination issues. The following day after planting, approximately 2 inches of rain fell with one additional inch of rain two days later. The soil compaction from the rainfall resulted in an overall emergence rate of 39%, with a final stand of approximately 54,000 plants per acre.

Plant population studies have been conducted across Louisiana in the past few years. These studies can be useful in making replant decisions. Data from a trial at the Dean Lee in 2019 examined planting rates from 50,000 plants per acre to 175,000 plants per acre in 25,000 plants per acre increments. The average bushels per acre did increase for every 25,000 plants per acre until the planting rate of 175,000 plants per acre, but the differences were not statistically significant. The yield was not statistically different for any planting rate until less than 75,000 seeds were planted per acre.

Figure 3. Data from Dean Lee in 2019 suggest planting rates between 75,000 to 175,000 seeds per acre will not have significantly different yields. However, planting rates below 75,000 seeds per acre may have significantly different yields.

These plant population studies indicate that a soybean stand must be greatly reduced before considering replanting. Soybean plants have an amazing ability to compensate for lower populations by filling in gaps with increased branching. However, fields that have less than 70,000 plants per acre or uneven emergence with wide gaps may need to be considered for replanting. Wide gaps that will not be covered with soybean canopies will result in increased weed pressure and decreased irrigation efficiency. To determine plant stands, random plant counts from several areas — at least 10 — in a field should be conducted. The following table provides the length of row from which plants should be counted in. Record the number of plants from each location and take an average. Then multiply the average number by 1,000 to get the average plant stand count for the field. For example, for 38-inch rows, the average plant count from 10 random areas in the field averaged 80 plants from 13 feet, 10 inches of row. Multiplying 80 by 1,000 gives an average stand count of 80,000. Based on this information, it is likely that it would not be economically beneficial to replant the field.

Table 1. Row spacing in inches and corresponding length of row from which to count plants for 1/1000' of an acre and row feet per acre for each row spacing.

Row spacing in inches	Length of row to count plants	Row feet per acre
7.5	69' 8"	69,696
10	52' 4"	52,272
15	34' 10"	34,848
19	27" 5"	27,511
20	26' 1"	26,136
30	17' 5"	17,424
36	14' 6"	14,520
38	13' 10"	13,756
40	13' 1"	13,068

Several factors should be considered to determine if replanting would be needed and profitable. The additional seed cost will likely be the most profit limiting aspect of replanting soybean. The next most important consideration is that soybean planted later in the growing season (late May to June) will have less vegetative growth, resulting in decreased photosynthate material and nodes per plant. The decrease in vegetative structure will often result in less potential yield. If the canopy does not close, it will be more difficult to control weeds and maintain soil moisture content. The potential for late season insect and disease pressure should also be considered. All these factors will limit the profitability of the replanted crop. If replanting is warranted, use seeding rates appropriate for the time of year. If you have any questions or are considering replanting, please feel free to contact us or your local AgCenter agent.

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When to plant cotton

By Dan Fromme, LSU AgCenter cotton specialist

Cotton planting is just around the corner in Louisiana, and now is a good time to review a few key practices to help everyone get off to a great start in 2020. It is always best to plant according to soil temperature and not the calendar. If a field is planted too early, your cotton crop may suffer a stand loss and cold temperature stress, which reduces yield potential.

Germination can begin when the mean daily temperature is 60 degrees F at seeding depths, but growth will be slow at these temperatures. A soil temperature of 65 degrees at a depth of 4 inches for three consecutive days and a favorable five-day forecast following planting is best. Also, nighttime minimum temperatures should be forecast to be above 50 degrees for the following five days. During the critical germination period, soil temperatures below 50 degrees can cause chilling injury to germinating cotton. Emergence will generally occur after accumulation of 50 to 80 DD60s, or heat units, after planting. Planting should be delayed if the five-day forecast predicts the accumulation of less than 25 heat units after planting. The minimum plant population in the final plant stand should be no less than two healthy plants per foot.

Creating a pest-free seedbed is critical to avoiding problems from cutworms and spider mites. Burndown herbicide applications should be made at least four weeks prior to planting to ensure no green vegetation is in the field for these pests to survive. It is equally important to eliminate weedy host plants on field borders to reduce insect pest problems that might move into adjacent cotton fields later.

For additional information on when to plant cotton, see our publication at https://www.lsuagcenter.com/profiles/bneely/articles/page1545324682192.

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Weed management thoughts: Planting cotton and soybeans in 2 to 3 weeks

By Daniel Stephenson, LSU AgCenter weed scientist

To manage weeds preplant — meaning two to three weeks prior — or preemergence, an application of paraquat at 0.5 to 0.75 lb/A plus a residual herbicide is needed to remove existing weeds and keep fields weed-free. If paraquat is applied preplant, a second application may need to be applied at planting to remove any remaining green vegetation.

If 2,4-D, dicamba, Elevore and others may be applied, read the label because there are planting restrictions for cotton and soybeans. However, there are no planting restrictions for Enlist Duo and Enlist One in Enlist crops or Engenia, FeXapan, Tavium and XtendiMax in Xtend crops.

Choosing a residual herbicide, whether applied preplant and/or preemergence, depends on the crop to be planted and the weed spectrum. There are numerous choices of residual herbicides labeled preplant and preemergence in cotton, but research has shown that Cotoran at 2 pints/A is a good choice for control of numerous grass and broadleaf weeds. If glyphosate-resistant Palmer amaranth and waterhemp are a major concern, Brake plus Cotoran, both at 1 pint/A, is an excellent choice.

In soybeans, there are numerous residual herbicide options. Many will provide control of glyphosate-resistant pigweeds; however, they differ in the other weeds they will control. For example, if pigweed, yellow nutsedge and grasses are the targets, Boundary at 1.5 to 2 pints/A is a good choice. But if morningglory or smellmelon are also an issue, herbicide formulations that contain sulfentrazone (Authority formulations, Sonic, BroadAxe, etc.) or Canopy DF at 4 to 6 oz/A plus S-metolachlor at 0.95 lb/A would provide control. Please contact your local LSU AgCenter agent to discuss your specific weed spectrum and residual herbicide options.

The length of maximum control provided by a residual herbicide is usually three to four weeks when properly activated. So if applied two weeks prior to planting, one may only expect one to two weeks of residual control in-crop. In contrast, if the residual is applied preemergence, three to four weeks of control may be expected in-crop. The choice of preplant or preemergence residual herbicide application will influence when the first in-crop postemergence application should occur. Remember, seedling cotton and soybeans must be protected from weed competition to help maximize yield potential, so plan accordingly.

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Cotton nitrogen rates

By Dan Fromme, LSU AgCenter cotton specialist

Once the cotton stand has been established, nitrogen applications will be made for the upcoming season. Recommended nitrogen rates are 60 to 90 pounds per acre for coarse-textured soils and 90 to 120 pounds per acre for high-clay soils. The lower recommended rates should be used on fields that are following soybeans, corn or legume cover crops and fields with a history of excessive stalk growth. Caution should be used to not apply more nitrogen than what will be required by the cotton plant because excessively high nitrogen rates can produce very tall and rank cotton. This increased vegetative growth will hinder reproductive growth and ultimately yield. Furthermore, to limit this excessive growth, producers will have to rely heavily on mepiquat chloride applications to control plant height and creating the potential for making the cotton plant harder to defoliate at the end of season. Excessive nitrogen, especially in combination with high amounts of late-season rainfall, can delay maturity, reduce harvesting and ginning percentages, and promote boll shedding and boll rot.

Also, best management practices suggest making split applications of nitrogen, especially on sandy soils with a high leaching potential and soils with a high saturation potential due to denitrification losses. For split nitrogen applications, a third to half should be applied at planting, with the remainder being applied by early bloom at the latest.

Table 1. Nitrogen rates for cotton in Louisiana

Soil type	**Dryland**	**Irrigated**
Clay	90-120	100-120
Clay loam	90-120	100-120
Fine sandy loam	60-90	60-90
Loamy sand	60-90	60-90
Silt clay	90-120	100-120
Silt clay loam	90-120	100-120
Silt loam	60-90	60-90
Very fine sandy loam	60-90	60-90

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Considerations for improving on-farm water management

By Stacia L. Davis Conger, LSU AgCenter engineer

If planting happens to be delayed due to wet conditions, here are a few reminders and a few new considerations to help with navigating this upcoming irrigation season.

1. Review readily available irrigation water management technologies

This is a good time to review which technologies work best with your current management strategies.

Computerized hole selection (CHS)

The purpose of CHS is to determine the correct hole sizes along the lay-flat irrigation pipe so that all rows water out at the same time while maintaining an acceptable pressure within the pipe. The software is a free alternative to an engineer designing the distribution across the field. Once the hole sizes are determined, a printout can be given to the hole puncher to take into the field during setup. There are two CHS options: PHAUCET and PipePlanner. Delta Plastics' PipePlanner has become the most popular software due to the easy point-and-click website design combined with the complexity of Louisiana's farming operations and field shapes. However, PipePlanner requires a good internet connection and may require a few training sessions with me, an extension agent or a Delta Plastics representative to get the process down. PHAUCET is a downloadable program and does not require the internet to run. Its lack of modern design (looks like a Windows 95 program) makes it less user-friendly and can get complicated with oddly shaped fields. However, both programs have the same hydraulics calculations behind the interface, will give the same results and are free to use.

Surge irrigation

Surging furrow irrigation events involves moving the water across the field in multiple segments in effort to improve infiltration uniformity (less overwatering at the head, less underwatering at the tail, less runoff). This process can be completed manually by switching between two or more irrigation sets every few hours or with a surge valve that automates the process. Implementing this method can consistently provide water savings (reported as 10% - 50%) while helping to even out yield response to water stress across the field. Information about net profits associated with surge irrigation can be found here. Surge valves are available from P&R Surge Systems, Inc. and DamSurge, but locally made valves may be available.

Soil moisture sensors (SMS)

With regular access to soil moisture data, trends in water loss can help to predict when irrigation will be needed, determine root growth, find compaction layers and estimate how much of that last rainfall (or irrigation) actually entered the soil. There are many different types, styles and data collection methods that need to be considered before investing in a product or product line. Most universities have extension information available to help inform your decisions, but make sure to check the recommendations based on soil type, as that is the most important factor in getting good data. Please check out our videos on scheduling irrigation and furrow irrigation technologies on YouTube.

Automated pump/valve control

This recommendation is a new one from us, but only because it is a fairly new product line for the mid-South market. Automating pumps remotely and switching between irrigation sets without touching the alfalfa valve can be extremely helpful in managing irrigation more efficiently. Typically, these products require an app or website to control the irrigation infrastructure and provide irrigation and maintenance records at the end of the season. They can be used to manually control all devices (remote operation) or can be fully automated. How many times has irrigation continued to run for an additional few hours (or more) until someone could make it back to shut off the pump? Though complete automation is ideal, it does not mean that irrigation should be ignored. Issues common to furrow irrigation such as busted pipes, animal damage and large changes in flow rates can still negatively impact efficiency. Loss in wireless connection can also be an issue in rural areas.

2. Appoint an irrigation manager
Many times, farmers describe getting behind with irrigation while focusing on other issues such as insect pests, diseases and weeds. It is understandable given the fact that irrigation is not always required, whereas other issues occur every crop season. To help avoid this occurrence, consider the appointment of an irrigation manager. This person would be responsible for irrigating on time and as efficiently as possible. There are many creative options for incorporating this position within most operational styles. Examples include hiring a crop consultant with soil and water responsibilities, providing an end-of-season bonus to a trusted farmhand during a big irrigation year or hiring a full-time irrigation manager that can work on improvements when not in the field.

3. Fine-tune drainage and water quality
With such wet conditions currently, this is a good time to revisit on-farm drainage. There are two main considerations: moving water off the field in a timely manner and ensuring that good-quality drainage water enters the natural environment. In the short term, newly cut ditches can help drain low spots more quickly, but they may not be the best long-term solution and can increase erosion potential. Water routing plans should be completed using accurate elevation maps, current drainage patterns and soil type considerations that affect infiltration. In some soil types, such as those with a hard pan and sealing surfaces, considering tile drains with the benefit of sub-irrigation strategies may be a good investment. Even if maintaining the current ditch structure, establishing a buffer between farm discharge outlet(s) and local water bodies can greatly improve downstream water quality. You can find more information on buffers from NRCS.

4. Available weather data
In February, the LSU AgCenter released a new page on the website to provide weather variables from an updated weather network called Louisiana Agriclimatic Information System (LAIS). This updated LAIS network includes a minimum of one station within each region around the state. As they continue to develop the product, future capabilities include providing daily reference evapotranspiration values that can be used to schedule irrigation using estimated methods such as the checkbook method. Please reach out to me or your local extension agent to gain access to our checkbook method spreadsheet that will be publicly released later this year.

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Coronavirus pandemic impacts PPE supply

By Kim Brown, LSU AgCenter pesticide safety coordinator

Due to the COVID-19 pandemic, there is a critical need for N95 respirators for health care providers. Currently, there are few, if any, dust- and mist-type respirators or particulate filters (N, P or HE) available in the marketplace. Some herbicide, fungicide and insecticide labels require respirators to protect applicators from exposure. Many may not feel the effects of shortages until later in the year, but this could potentially cause issues if applicators do not have the necessary stockpile to make it through the year.

Pesticides must be applied with proper personal protective equipment (PPE). This is to ensure applicator safety while using the pesticide product, and the EPA is not relaxing these requirements. Homemade masks are not sufficient substitutes for label-required respirators and masks.

Talk to your local LSU AgCenter agent or specialist about alternative products or practices that do not require the same PPE. For pesticide products that require a respirator, review online label search platforms (registrants, Agrian, CDMS Label Database, EPA PPLS, NPIRS, Kelly Registration System) for available alternative products that do not require a respirator requirement. There may be a product with the same active ingredient but a different formulation that reduces the need for respiratory protection.

Applicators who do not follow the label PPE requirements because of a lack of access to a respirator put themselves at significant risk, potentially add to the need for medical care and are in violation of the label.

For gloves, consider purchasing reusable ones and wash them. Nitrile rubber gloves are great for most formulations.

At this time, the Louisiana Department of Agriculture and Forestry and LSU AgCenter have postponed all recertification trainings in the state. They have not yet been rescheduled; letters will be mailed to applicators when new dates are selected. You may also check www.lsuagcenter.com/pesticide for more information as it becomes available.

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