LOUSIANA CROPS NEWSLETTER

Corn, Cotton, Grain Sorghum, Soybeans, and Wheat

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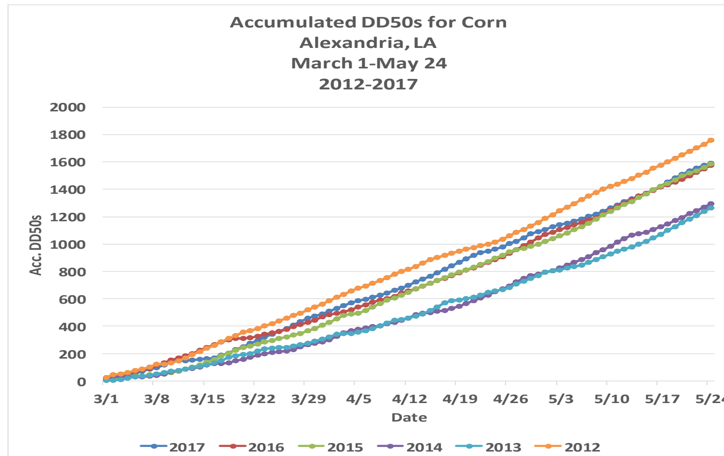
In This Issue

DD50s in Corn

Dan Fromme, Dean Lee Research Station

Accumulated DD50s for Alexandria since March 1st are found in the following chart for the years 2012-2017. 2017 accumulated DD50s through May 24 are similar to the 2015 and 2016 years. Calculation of DD50s are based on the modified growing degree formula:

- Average daily temperature minus 50F.
- Ceiling for daily maximum temperature is 86F.
- Similarly, daily minimum temperature base can be no lower than 50F.



Wrapped and Twisted Whorls in Corn

Dan Fromme, Dean Lee Research Station

Earlier in the season around V5 to V6 stage corn could be found with wrapped and twisted whorls in isolated fields throughout the state of Louisiana. The lower most leaves were normal in growth; however, around the sixth or seventh leaf the whorl was tightly wrapped and often bent over at right angles to the ground (figure 2.). This phenomenon did not occur in a large number of fields or a large percentage of plants within these fields. Your first instinct is to blame this occurrence on herbicide injury, but this was not the case. Speculation on the cause of this phenomenon includes when young corn shifts quickly from periods of slow development (cool, cloudy weather) to rapid development (warm, sunny weather). Others have argued that it is the reverse where growth transitions from rapid periods of development to slow. Also, wind damage can possibly be blamed by somehow damaging the young inner whorls. Reports from other parts of the country have included that it is not uncommon to see hybrids vary in the frequency of twisted whorls.

The appearance of twisted whorls is indeed very alarming at first; however given another week most of the plants were unfurled and subsequently developed normally. If the twisted whorls were not noticed, you would have noticed yellow tops across the field once the whorls had unfurled (figure 2). The final opinion from other parts of the country have reported that yield impact on from these twisted plants are minimal, if any.

Figure 1.

Figure 2.

Tillering in Corn

Dan Fromme, Dean Lee Research Station

During the past two seasons, numerous calls have been received asking about tillering in corn. Tillers are branches that develop from buds on the five to seven stalk nodes of a corn plant (figure 1). Tillers are morphologically identical to the main stem (also know as the culm) and they are capable of developing their own roots, nodes, leaves, ears, and tassels. There are a number of reasons that tillers develop. Plant population, spacing, soil fertility, early season growing conditions, and the genetic background of the hybrid can cause tillers or suckers to develop. Tillers are more likely to be found on plants that are located in thin areas of the stand or near field edges. Tillers can develop when soil fertility and moisture supplies are good. Many of the hybrids may have retained more of the genes related to tillering from ancestors of corn. The only time tillering can be a problem is when two or three tillers per plant are present. This may indicate problems with stand density and distribution of the corn plants. If stand density is adequate there is no cause for alarm. Studies have shown that the impact of tillering is not limiting yield.

Figure 1.

Potassium Deficiency and Soil Compaction in Corn

Dan Fromme, Dean Lee Research Station

Several calls were received earlier in the season with concerns about observing potassium deficiency symptoms in corn. Symptoms first appear as yellowing and dying of lower leaf margins. Plants with impaired root systems are most likely to show symptoms after about the V6 when plant potassium uptake increases. Potassium is mobile in the plant and if the deficiency persists, symptoms develop on higher leaves. Potassium deficient corn tends to lodge later on in the season. One field, plants were not only showing potassium deficiencies but were even shorter in plant height (figure 1). In the areas that these deficiency symptoms were prevalent, a soil penetrometer revealed there were issues with soil compaction. Potassium deficiency is favored by conditions that limit early root growth due to root pruning, root rots, dry soils, compacted soils, and seed-trench sidewall smearing. Last but not least, symptoms are associated with low potassium testing soils, sandy soils, and more common in reduced tillage systems, especially in dry seasons (figure 2).

Figure 1.

Figure 2.

Corn Disease Update

Trey Price, Macon Ridge Research Station

Fortunately, very few seedling disease issues were observed in corn this spring. A few isolated areas where a combination of sidewall compaction (Figure 1) and *Rhizoctonia solani* and/or *Pythium* spp. causing reduced stands and seedling vigor were observed. The sidewall compaction slowed seedling development resulting in less vigorous plants making them more susceptible to disease. Any operation that alleviates sidewall compaction and/or seed treatments containing active ingredients effective on the previously mentioned pathogens would be the course of action next season. Overall impact of this situation has been minimal.

Figure 1. Sidewall compacted corn: with furrow (left), and across furrow (right).

Shortly thereafter, we started fielding (and continue to do so) many complaints of paraquat drift or Holcus spot statewide. The two maladies display round to oval, light tan to white spots with or without yellow halos and can be difficult to distinguish from each other based on symptoms alone. Generally, if a drift pattern (gradient) is observed, if affected areas are large and more jagged than round, or if secondary fungi are within lesions, it is likely paraquat drift (Figure 2). If the distribution is random, the spots appear within 48 hours of a thunderstorm, and water-soaking is observed, it is likely Holcus spot (Photo 3). Microscopic observation of Holcus spot may reveal bacterial streaming, as the disease is caused by *Pseudomonas syringae* pv. *syringae*. Both issues are usually of minor concern, with the exception of paraquat drift heavy enough to affect corn stand and yield.

Figure 2. Paraquat drift

Figure 3. Holcus spot

Common rust observations followed, and the disease can be found in virtually every corn field in the state. Pustules of common rust are brick red in appearance, somewhat elongated, and will appear on both leaf surfaces (Figure 4). Some stakeholders are currently mistaking common rust with southern rust. We do not have any confirmed southern rust observations in Louisiana to date! Southern rust pustules are more orange than brick red, usually not as elongated, and almost always appear on the upper surface of leaves (Figure 5). Common rust will progress under current conditions (relatively cool, rainy, cloudy); however, very rarely are fungicide applications warranted for common rust. Warmer temperatures will greatly slow common rust development.

Fig. 4 Common rust.

Figure 5. Southern rust (upper surface, left; lower surface, right).

Anthracnose, caused by *Colletotrichum graminicola*, has been observed in lower most leaves of a few corn fields in NELA. Lesions are ellipsoid and irregular, brown to tan, with fruiting bodies (black acervuli) embedded. Lesions usually have yellow halos (Figure 6) but occasionally may not (Figure 7). Black setae (spiny, hairlike) arise from lesions and are visible with a hand lens. Under humid conditions, pink to orange sporulation may be observed within lesions. Cool, cloudy conditions favor infection, and the disease is observed low in the canopy during the early season and in the upper canopy during late season. Most hybrids are resistant to anthracnose, and fungicide applications for management in Louisiana are very rare. However, fungicides are effective on anthracnose in the unusual case where one is warranted.

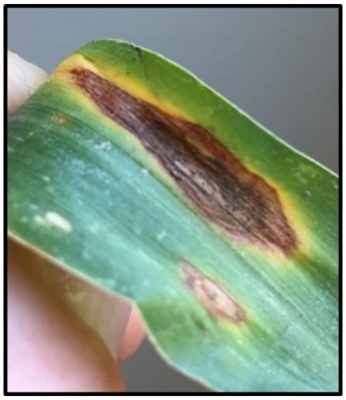


Figure 6. Typical anthracnose lesion with yellow halo.

Figure 7. Atypical anthracnose lesion without

Northern corn leaf blight (NCLB), caused by *Exserohilum turcicum* has been observed in susceptible hybrids as early as V6. The warm, sunny weather over the past couple of weeks has kept NCLB at bay; however, current conditions (relatively cool, rainy, cloudy) are optimal for NCLB development. The disease will first appear in susceptible hybrids in areas where there is reduced tillage and corn as the previous crop. Symptoms are usually first observed in the lower-most leaves as small water-soaked, cigar-shaped areas (Figure 8). Disease progression lines may be observed in these early lesions. Older lesions will be larger (up to 6 inches long) and have tan to brown centers with black sporulation evident (Figure 9). Rain and wind will spread spores from older lesions creating new infections, usually progressing upward throughout the canopy. It is generally thought that hot and dry weather will slow NCLB disease development. This may be true for dryland corn; however, in my experience with irrigated corn in Louisiana, NCLB will continue to progress throughout the season. Irrigated fields are cooler within the canopy and have longer periods of leaf wetness, thereby making conditions favorable, although not optimal, during hot weather.

Fig. 8. Early symptoms of NCLB.

Fig. 9. Older NCLB lesion.

Northern corn leaf blight may cause severe leaf area loss in susceptible hybrids. Ratings from OVTs (http://www.lsuagcenter.com/profiles/fgould/articles/page1483997206927) may provide some insight on whether or not your hybrids are highly susceptible. Fungicides may be effective on the pathogen, although data for Louisiana is very limited. Please see Fungicide Efficacy for Control of Corn Diseases-2017 at http://www.lsuagcenter.com/topics/crops/corn/diseases

Corn can tolerate the least amount of defoliation near tasseling. As the crop progresses past tasseling and silking, plants can tolerate increasing amounts of defoliation with time (Table 1). Data below in blue indicates % yield loss.

Table 1. Percent corn yield loss as a result of defoliation by growth stage. Adapted from National Crop Insurance Service, 1984.

	% Defoliation									
Growth Stage	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
Tassel	3	7	13	21	31	42	55	68	83	100
Silked	3	7	12	20	29	39	51	65	80	97
Silks Brown	2	6	11	18	27	36	47	60	74	90
Pre-Blister	2	5	10	16	24	32	43	54	66	81
Blister	2	5	10	16	22	30	39	50	60	73
Early Milk	2	4	8	14	20	28	36	45	55	66
Milk	1	3	7	12	18	24	32	41	49	59
Late Milk	1	3	6	10	15	21	28	35	42	50
Soft Dough	1	2	4	8	12	17	23	29	35	41
Early dent	0	1	2	5	9	13	18	23	27	32
Dent	0	0	2	4	7	10	14	17	20	23
Late Dent	0	0	1	3	5	7	9	11	13	15
Nearly Mature	0	0	0	0	1	3	5	6	7	8

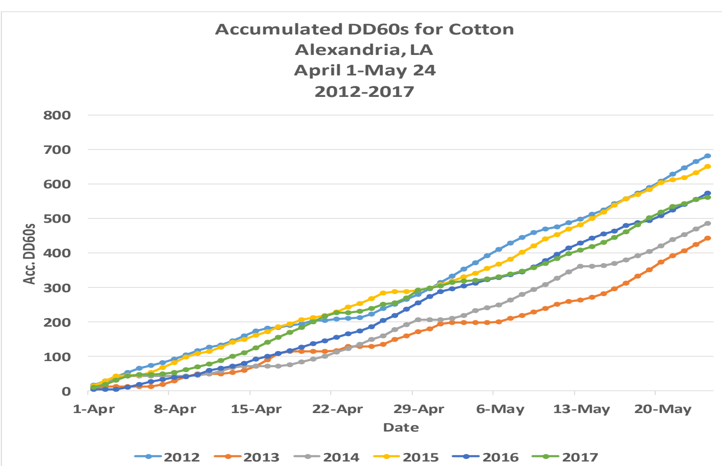
On the following page, the disease severity scale (Figure 10) may help in determining disease severity for a given field. Keep in mind that fungicide application decisions must be made on a field by field basis taking into account hybrid, previous crop, tillage regime, disease severity, prevailing environmental conditions, and previous experience.

Figure 10. Disease severity scale for NCLB.

DD50s in Cotton

Dan Fromme, Dean Lee Research Station

Accumulated DD60s for Alexandria since April 1st are found in the following chart for the years 2012-2017. Currently, 2017 accumulated DD60s through May 24 are similar to the 2016 season. Calculation of DD60s are based on the high temperature + the low temperature of the day divided by 2 minus 60.



Cotton Disease Update

Trey Price, Macon Ridge Research Station

April planted cotton seedlings have had a rough start so far this year with cool and wet conditions prevailing for several weeks after planting. *Rhizoctonia solani* has been the culprit in the vast majority of field calls thus far. This pathogen may infect (reddish brown sunken lesions) seedling stems at the soil line resulting in plant death, or damping off (Figure 1). Lesions also may occur below the soil surface on roots with plants otherwise appearing perfectly healthy above ground (Figure 2). There is nothing that you can do (e.g. foliar applications) after plants are affected to alleviate the problem.

Fig. 1. Lesion caused by Rhizoctonia solani.

Fig. 2. Taproot infection by R. solani.

Most farmers are proactive and have planted seed with the proper seed treatments utilizing multiple modes of action (strobilurin and SDHI treatments are most effective on *R. solani*) to ward-off seedling diseases; however, during extended periods of cool, wet weather, disease pressure will be high, cotton is not actively growing, and seed treatment efficacy steadily declines with time under these conditions. In most situations cotton seedlings will recover from infection, particularly if we are blessed with a more summer-like weather pattern. However, infected plants will suffer delayed maturity, less ability to compensate for other stresses, and possibly lower yields in severe cases (Photo 3).

Figure 3. Cotton plant recovering from R. solani infection (left) vs. healthy plant (right).

To this point in the season, replanting because of seedling disease issues has been minimal, and plants in affected fields have made an impressive recovery. A few weeks ago I made the statement that our May-planted cotton would fare better; however, it is currently 67F and raining with a low of 55F in two days. Mother Nature can certainly throw us curve balls at any given time. I expect to encounter more fields that were planted within the last two weeks with seedling disease problems; however, I think disease incidence and severity will be lower than our April-planted fields. Warm, sunny weather is the best medicine for our cotton crop right now. Please contact your local county agent or specialist for more information.

Soybean Growth Stages

Boyd Padgett, Dean Lee Research and Extension Center

Every year soybean producers, consultants, extension agents, and specialist make herbicide, insecticide, fungicides, and defoliant applications based on a specific growth stage. Pesticide labels may recommend when or when not to apply a pesticide. Therefore, it is important that individuals make an accurate assessment of the growth stage prior to application of a pesticide to optimize efficacy and possibly prevent crop injury. It would be nice if all plants in field matured uniformly across the field, but this is not the case. To further complicate the issue, it is common to find flowers and pods of varying sizes on a single plant.

The vegetative growth stages are very straight forward. However, when assessing the reproductive growth stage of a crop, individuals should base this on what is occurring in the uppermost four nodes (except R1). Listed below are the descriptions and figures of selected growth stages of soybean. There are several good sites on the internet that provide additional information (ex. http://www2.ca.uky.edu/agcomm/pubs/AGR/AGR223/AGR223.pdf). Table one that is included after these photos provides the estimated time of development for each stage.

Fig. 1. VE=Emergence

Fig. 2. VC=Cotyledon, unifoliate leaves are fully expanded.

Fig. 3. V1=One fully expanded trifoliate.

Fig. 4. V2=Two fully expanded trifoliates.

Fig. 5. R1=Beginning Bloom.

Fig. 6. R2=Fully Bloom, one flower on the uppermost two main stem nodes.

Figure 7. **R3=Pod initiation, A 3/16 inch pod at one of the four uppermost nodes on the main stem.**

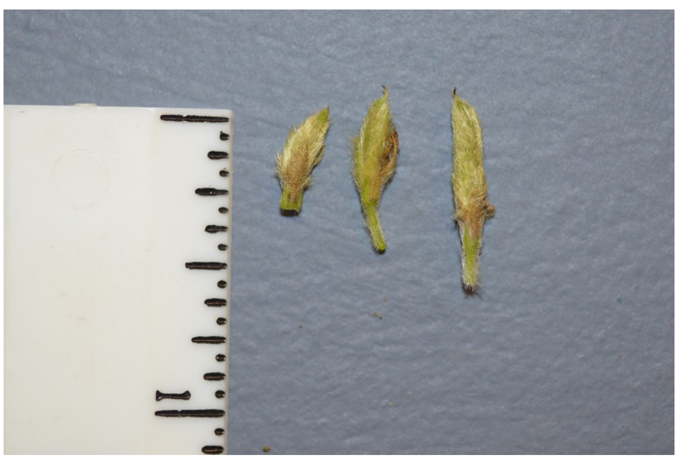


Figure 8. **R3=Pod initiation, A 3/16 inch pod at one of the four uppermost nodes on the main stem.**

Figure 9. **R4=Full Pod, A 3/4 inch pod at one of the four uppermost nodes on the main stem.**

Figure 10. **R5=Seed is 1/8th inch long in a pod at one of four uppermost nodes on main stem.**

Figure 11. R8 **=Fully Mature, 95% of pods mature color. A photo can be found on website listed above.**

Table 1. Number of days between soybean stages.

Stages	Average # of days	Range in # days
Planning to VE	10	5-15
VE to VC	5	3-10
VC to V1	5	3.10
V1 to V2	5	3-10
V2 to V3	5	3-10
V3 to V4	5	3-8
V4 to V5	5	3-8
Beyond V5	3	2-5
R1 to R2	3	0-7
R2 to R3	10	5-15
R3 to R4	9	5-15
R4 to R5	9	4-26
R5 to R6	15	11-20
R6 to R7	18	9-30
R7 to R8	9	7-18

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Soybean Disease Update

Trey Price, Macon Ridge Research Station

Overall our soybean crop has fared well so far. Some early-planted soybean fields had issues with *Rhizoctonia solani*; however, replanted acreage has been minimal. Lesions caused by *R. solani* in seedling soybean appear as reddish, sunken areas near the soil line often girdling the stem resulting in plant death (Figure 1). As a result thinned stands may need to be replanted depending on plant populations (Figure 2). Over the past couple of weeks, warm and sunny conditions have prevailed, and our soybean crop looks great. However, conditions are currently favorable for *R. solani* infection, and any soybean that were planted within the last couple of weeks may have issues. Strobilurin and SDHI seed treatments are very effective on *R. solani*, but will steadily decline in efficacy after planting.

Figure 1. Soybean seedling infected with R. solani.

Figure 2. Thin stand as a result of R. solani.

We have already received multiple calls concerning taproot decline, caused by *Xylaria* spp., and have seen symptoms as early as VC-V1. Symptoms at this stage are on cotyledons and appear as somewhat interveinal orange to brown mottling (Figure 3). These symptoms along with seedling death often go unnoticed as soybeans quickly grow and cover up obviously affected plants. Symptoms in vegetative stages appear a bit more distinct as interveinal chlorosis followed by necrosis (Figure 4). When infected plants are dug-up, tap and lateral roots exhibit a blackened appearance (Figure 5). Taproot decline is a season-long disease, and infected plants may die at any stage; however, the disease typically goes unnoticed until pod fill, and affected fields look like they are “cutting out early” (Figure 6).

Figure 3.

Figure 4.

Figure 5.

Figure 6.

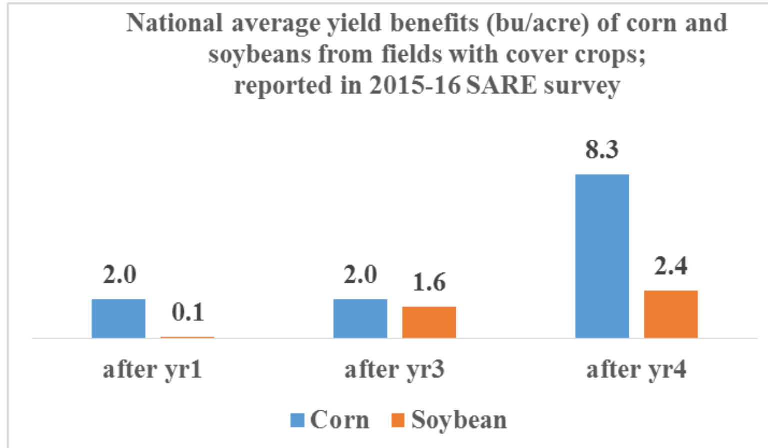
Fields that are following soybean and in reduced tillage are most likely to be affected with taproot decline. Preliminary data indicates that some soybean varieties may be resistant, and we are currently working to screen varieties in multiple locations to confirm our results. Data from limited field trials indicates that seed treatments or in-furrow applications of fungicides are not effective at reducing taproot decline incidence. Anecdotal evidence indicates that rotation to corn or tillage may reduce taproot decline incidence and severity. Preliminary estimates from producers' fields indicate that losses may reach 25% in severely affected fields.

Help us learn more about taproot decline! We have a graduate student studying the pathogen and its distribution along with mechanisms of infection. The more locations we have, the better. Please send GPS coordinates of suspected fields to pprice@agcenter.lsu.edu or drop a pin and send to 318-235-9805. Thanks.

Soil Management Health Practices: An Economic Perspective

Naveen Adusumilli and Syam Dodla

Conservation agencies have pushed cover crops and other soil health practices as measures that would provide a suite of benefits such as an increase in crop yield, a decrease in fertilizer use, soil and nutrient runoff, and improvement in overall soil quality. Yield takes the majority of the benefits of the cover crops and adds them up for the net improvement in profitability. National cover crop survey indicates an increase in crop yields following cover crops.



Source: SARE cover crop survey

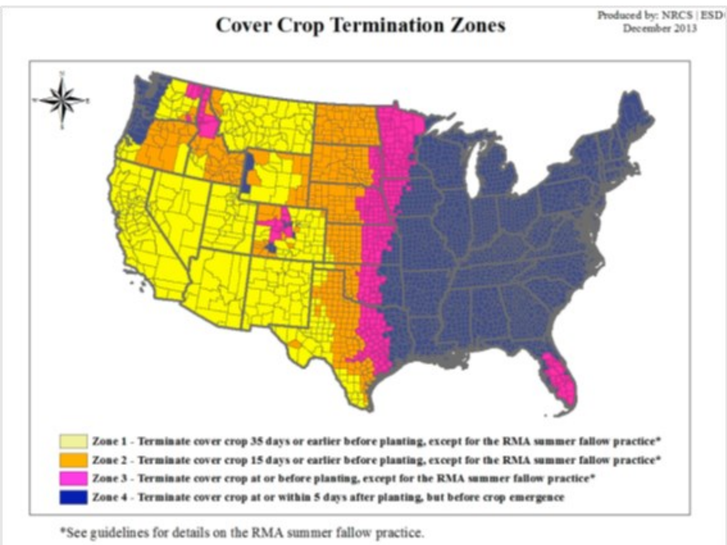
Voluntary conservation program, Environmental Quality Incentives Program (EQIP), where farmers can enroll to receive financial assistance on a per acre basis to adopt conservation practices. Financial assistance for EQIP qualified practices helps minimize the economic burden of adoption of management practices by farmers who are unsure of the potential of such practices in providing an improvement to on-farm productivity and soil health. Often, conservation practices can be combined to receive a higher financial assistance per acre. The financial assistance program often runs on a reimbursement model but some farmers can be eligible for up to 50 percent advance payment to cover their costs.

EQIP funding for most popular soil health practices and alternatives for selection of these practices are shown below.

Cover crop	No-till	Reduced Till	Total Assistance
$60-$70/ac.-up to five years	$13/ac.-up to 3 years	$14/ac.-up to 3 years	
X			$300/acre for 5yrs
	X		$39/acre for 3yrs
		X	$42/acre for 3yrs
X	X		$339/acre for 3yrs then $300/acre for 2yrs
X		X	$342/acre for 3yrs then $300/acre for 2yrs

Other practices such as "Nutrient Management Plans" provide financial assistance; however, the plan includes variable rate application of fertilizer, a nitrification inhibitor, and soil nitrate testing and/or plant tissue testing to estimate soil available nitrogen. In other words, a more rigorous adoption of practices and analysis to show that the practices are providing the anticipated benefits. The financial assistance to this category is approximately $23 per acre.

Often times, questions arise regarding the adoption of certain practices and how their adoption is tied to crop insurance. Sustainable Agriculture Research and Education (SARE) cover crop survey results indicate the most important factor that would motivate farmers to adopt cover crops is a tax credit and/or a discount on their annual crop insurance premium. Although a discount on crop insurance premiums is not available, NRCS, Risk Management Agency, and Farm Service Agency have encouraged such practices. Guidelines were developed to help farmers manage practices such as cover crops. For cover crops, Louisiana is in "management zone 4", where cover crops grown under non-irrigated conditions need to be terminated at or within five (5) days after planting of main or insured crop, but before crop emergence.



Picture adopted from NRCS Cover Crop Termination Guidelines Report.

Soil management practices can provide enormous benefits. LSU AgCenter, NRCS, and other conservation agencies have long urged farmers to include such practices as part of their overall farm management goals. Preservation of land productivity while making more efficient use of natural resources is a prerequisite for reducing farm-related economic burden and promoting sustainable practices to future generations of farmers.

Upcoming Events

Tuesday, June 20

- Northeast Research Station Field Day
- 4589 Hwy. 605, St. Joseph, LA
- Registration at 8:30 a.m.
- Field tour begins at 9:00 a.m.
- Lunch will be provided at noon
- For more information contact:
    - Donnie Miller at 318-766-4607
    - Or at dmiller@agcenter.lsu.edu

Thursday, July 13

- 16th Annual Dean Lee Research & Extension Center Field Day
- 8105 Tom Bowman Drive, Alexandria, LA
- Registration at 8:30 a.m. at State Evacuation Center
- Field Tour begins at 8:50 a.m.
- Program at 11:20 a.m.
- Lunch will be provided at noon
- For more information contact:
    - Daniel Stephenson at 318-473-6590
    - Or at dstephenson@agcenter.lsu.edu

Specialists

Specialty	Crop Responsibilities	Name	Phone	Email
Cotton	Agronomic	Dan Fromme	318-880-8079	dfromme@agcenter.lsu.edu
Corn	Agronomic	Dan Fromme	318-880-8079	dfromme@agcenter.lsu.edu
Grain Sorghum	Agronomic	Dan Fromme	318-880-8079	dfromme@agcenter.lsu.edu
Soybeans	Agronomic			
Wheat	Agronomic	Boyd Padgett	318-614-4354	bpadgett@agcenter.lsu.edu
Entomology	Cotton, Corn, Grain Sorghum, Soybeans, and Wheat	Sebe Brown	318-498-1283	sbrown@agcenter.lsu.edu
Weeds	Cotton, Corn, Grain Sorghum & Soybeans	Daniel Stephenson	318-308-7225	dstephenson@agcenter.lsu.edu
Nematodes	All agronomic crops	Charlie Overstreet	225-578-2186	coverstreet@agcenter.lsu.edu
Pathology	Cotton, Corn, Grain Sorghum, Soybeans, and Wheat	Trey Price	318-235-9805	pprice@agcenter.lsu.edu
Pathology	Corn, Grain Sorghum & Soy-beans	Clayton Hollier	225-578-4487	chollier@agcenter.lsu.edu
Irrigation	Cotton, Corn, Grain Sorghum & Soybeans	Stacia Davis	904-891-1103	sdavis@agcenter.lsu.edu
Ag. Economics	Cotton, Feed Grains, Soybeans Marketing	Kurt Guidry	225-578-3282	kmguidry@agcenter.lsu.edu

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