Louisiana Crops NEWSLETTER

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CORN • COTTON • GRAIN SORGHUM • SOYBEANS • WHEAT

ISSUE HIGHLIGHTS

Cover crops

➤ If you want to plant cover crops, decide on your goals and strategy soon. *Page 1*

➤ Studies offer insight into how cover crops affect corn and soybean production. *Page 2*

Weed management

➤ The fight against weeds doesn't stop at harvest. *Page 5*

Corn hybrids

➤ Results from this year's official variety trials and on-farm core block demonstrations are available. *Page 7*

Soil compaction

➤ The off-season is a good time to check for problems. *Page 7*

Make winter cover crop plans

BY JOSH COPES, JAMES HENDRIX, LISA FULTZ, SYAM DODLA AND NAVEEN ADUSUMILLI

Crop harvest is in full swing across most of Louisiana. As we move into October, now is the time to begin planning your winter cover crop management strategy. Cover crops are used for several purposes, including protecting soil from erosion, improving soil structure, scavenging and cycling of soil nutrients, increasing organic matter and helping alleviate hardpans. Cover crop selection will depend on the goals a producer would like to accomplish. Also, having a clear objective for planting a cover crop will aid in cover crop selection.

For example, if minimizing soil erosion is the main objective, selecting a cereal cover crop would be a good choice. The fibrous root system of cereals will help prevent topsoil from leaving the field. Cereal winter covers are good nutrient scavengers as well. In contrast, a tap-rooted cover crop like a forage or tillage radish is better suited for deep nutrient scavenging, which potentially aids in loosening a soil compaction layer or preventing one.

Mixes of cereal and legume covers can reduce early season N fixation issues in corn. Preliminary data collected by AgCenter scientists have shown that in soybeans, legume cover crops can supply N for early growth needs until nodules develop. Another important consideration when selecting a winter cover crop is which cash crop is going to be planted following cover crop termination.

Be sure to plant only quality seed. This will help eliminate weed seed contamination issues. Seeding rates should be adjusted for germination percentage or pure live seed per pound. When planting legumes, make sure the rhizobium inoculant strain is correct for the legume that is to be planted and always inoculate. If planting pre-inoculated legume seed, be sure to get pure live seed per pound and adjust seeding rates accordingly; some pre-inoculated seed are larger and therefore have less pure live seed per pound.

Cover crops should be planted as soon as possible following main crop harvest. When planted earlier in the fall, growth and biomass production will be maximized prior to cold weather, which will slow growth and development of the cover crop. Planting your cover crop soon after harvest is especially important if corn will be planted. When planting corn, early cover crop termination combined with late planting of a cover crop (November) will reduce overall biomass production, therefore minimizing the benefits of the cover crop. Legumes are generally slow-growing if planted too late (November), and biomass production will be minimal prior to the onset of cold weather.

If fields are enrolled in a NRCS conservation program that requires cover crops, be sure to follow NRCS cover crop guidelines. Below is a link that contains NRCS seeding rates and planting dates for common cover crops grown in Louisiana. The planting window for most winter cover crops will be Oct. 1 to mid-November. Ranges for average first frost dates for Monroe, Shreveport, Alexandria and Baton Rouge are Nov. 15, 18, 19, and 29, respectively. Below are hyperlinks to additional helpful resources.

- NRCS planting dates and seeding rates for common cover crops grown in Louisiana
- Cover crop and tillage scenarios (potential scenarios and their implications on incentives payments)
- Q & A of conservation policy and crop insurance surrounding cover crops
- Cover crop economics decision tool §

Cover crops in corn, soybean production

BY LISA FULTZ

While not a new concept, the integration of cover crops into row crop production has increased rapidly in recent years. This increase stems from producers' growing desire to increase soil organic matter, reduce soil erosion, control weeds, improve nutrient cycling and increase yields.

Cover crops in no-till corn production

A five-year study at the Macon Ridge Research Station has examined the use of cover crops in no-till, continuous corn production as a possible means to reduce nitrogen fertilizer applications. All cover crops were planted by Oct. 15 of each year and terminated around Feb.1 of the following year using 2,4-D (16 oz/A) and glyphosate (32 oz/A). Nitrogen fertilizer (urea) applications ranged from 210 to 270 lbs N/A (2014 to 2016) and 80 to 240 lbs N/A (2017 to 2018). When compared to fallow conditions (0 N fertilizer and no cover crops), hairy vetch, crimson clover and Austrian winter pea increased yields by 39, 35 and 35 bu/A, respectively, with no other additions of nitrogen fertilizer (**Table 1**). When nitrogen fertilizer (regardless of rate) was applied increases in corn yields were measured following crimson clover, Austrian winter pea, hairy vetch, cereal rye and berseem clover when compared to the fallow treatment.

Nitrogen rates were adjusted in 2017 to better estimate the potential for cover crops to offset the need for nitrogen fertilizer applications. Averaged over the two years, corn following Austrian winter pea and crimson clover receiving 80 lbs N/A achieved the same yields as fallow plots where 160 lbs/A was applied (**Figure 1**).

TABLE 1 AND FIGURE 1 FOLLOW ON NEXT PAGE

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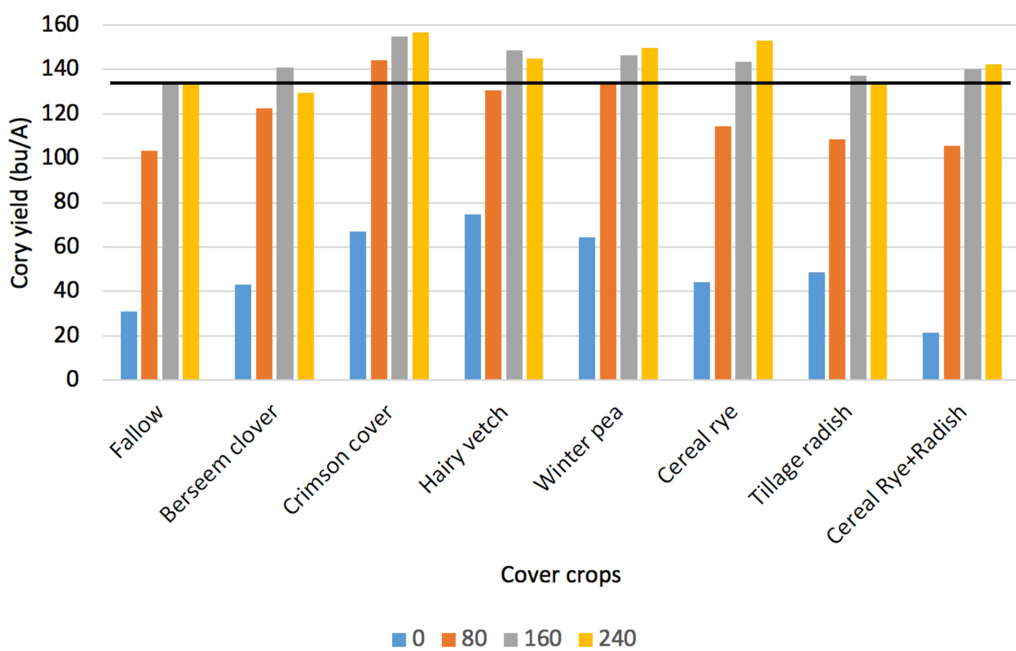
Table 1. Cover crop seeding rates and five-year average yields with no nitrogen fertilizer added and across all nitrogen fertilizer applications.

		FIVE-YEAR AVERAGE YIELD (BU/ACRE)	
COVER CROP	SEEDING RATE (LBS/ACRE)	0 NITROGEN APPLIED	ACROSS ALL N RATES
Fallow	N/A	52	127
Berseem clover	20	66	139
Crimson clover	15	87	154
Hairy vetch	20	91	149
Austrian winter pea	40	87	153
Cereal rye	70	65	140
Tillage radish	9	56	133
Rye + radish mix	65 + 4	28	120

Figure 1. Average corn yields (2017 to 2018) for seven cover crop treatments and four nitrogen application rates (0, 80, 160 and 240 lbs N/A. Black line represents average yield in fallow treatments at 160 lbs N/A fertilizer applications.



Soil samples collected in the fall at planting of cover crops and again the spring after cover crop termination were analyzed for soil organic matter and nutrient content. Cereal rye resulted in the greatest increase in soil organic matter, followed by hairy vetch and crimson clover. Nutrient content, specifically nitrogen, followed a predictable pattern with nitrate-N decreasing over winter as cover crops scavenge residual nitrogen from previous applications. In the spring following termination, ammonium-N concentrations increased, with the greatest increases following Austrian winter pea, cereal rye and crimson clover. As anticipated, the legumes (specifically Austrian winter pea and crimson clover) were capable of fixing nitrogen from the atmosphere, potentially increasing their contribution of plant available nitrogen. Cereal rye, scavenging nitrogen though its roots, also contributed to increased ammonium-N in the spring. Due to early termination (Feb. 1), yield increases were reduced compared to those following legumes.

This suggests that while cereal rye may reduce potential nitrogen losses from the soil, nitrogen may not have been readily available to the following corn crop. Overall, the greatest corn yield increases were measured following hairy vetch, crimson clover and Austrian winter pea, followed by cereal rye and berseem clover.

Cover crops in soybean production

Research is being conducted at the Red River, Dean Lee and Rice research stations to examine the relationship between cover crops and soybean production. At each location, cover crop treatments include cereal rye (70 lbs/A), crimson clover (15 lbs/A) and tillage radish (9 lbs/A) as well as fallow (no cover crop). To date, no differences in yield have been observed between fallow treatments and those seeded with cover crops. §

Top row from left to right, crimson clover, cereal rye and Austrian winter peas photographed Dec. 17, 2017.
Bottom row from left to right, crimson cover, cereal rye and Austrian winter peas photographed March 9, 2018.

Most cover crops recovered from colder temperatures this past winter; however, tillage radish, Austrian winter pea and berseem clover stands were significantly reduced at the Macon Ridge Research Station in Winnsboro.

Don't neglect fall weed management

BY JOSH COPES, DANIEL STEPHENSON, DONNIE MILLER AND LAUREN LAZARO

The trend of earlier crop harvest has resulted in adequate time for weeds to set seed between harvest and a killing frost. This time period can range from one to four months. The average first frost date in north and central Louisiana is Nov. 15 and 19, respectively. Because a lot of money and effort is spent in controlling weeds during the growing season to negate yield loss, timely weed control practices following harvest is important.

The objective of post-harvest weed management is to reduce viable seed return to the soil seedbank, thus ensuring fewer weeds to fight in future cropping seasons. Post-harvest weed control is especially important in fields with herbicide-resistant weeds.

A good example to illustrate the importance of post-harvest weed management is the ability of glyphosate-resistant Palmer amaranth to produce mature seed in as little as 30 days after emergence during late summer and early fall. Many other grass and broadleaf weeds are capable of setting viable seed in a similar timeframe.

Some common weeds infesting fields after harvest include barnyardgrass, morningglory species, prickly sida or teaweed, browntop millet, Palmer amaranth and waterhemp. Special attention should be made to ditch banks and other non-cropland areas infested with Palmer amaranth or waterhemp because their seed is easily spread in water.

For weeds present in the field at harvest time, mowing or tillage should be conducted as soon as possible upon harvest to ensure the viable seed set is reduced. Very little time will be required for these weeds to set a substantial amount of seed. Rainfall will influence subsequent germination of weed seed and, therefore, the need for additional weed control. Furthermore, rainfall following cultivation could increase weed seed germination. However, if the weeds are controlled, the soil seedbank would be reduced. Producers in no-till systems will have to rely on mowing and herbicides to prevent weed seed production.

In a stale seedbed production system, herbicide applications should be targeted from late September through October, when the time period from application to first killing frost is shortened. In minimum tillage systems or when weeds emerge after field prep operations, herbicides should be applied before or shortly after flowering. This implies that weeds will be large and more difficult to control; therefore, water volume should be maximized to ensure good weed coverage, as this is critical for good weed control. Multiple post-harvest herbicide applications for control of summer annual weeds should be avoided so as to minimize herbicide selection pressure that can lead to herbicide resistance. Using multiple effective modes of action will help minimize selection pressure (e.g. 2,4-D plus glyphosate or glufosinate plus 2,4-D, etc.).

Herbicide choice should depend on the weed species present in the field. Some soil residual herbicides can be applied in the fall following harvest. However, rotation interval restrictions must be followed and length of residual control will be influenced by soil temperature and saturation. Do not expect winter-long weed control from soil residual herbicides applied from August to early October. Likewise, the lack of rainfall to properly activate residual herbicides can negatively impact treatment effectiveness.

Fall herbicide applications can be effective for control of perennial weed species such as johnsongrass, bermudagrass, alligatorweed and redvine. Johnsongrass escapes are becoming more apparent across the state. Studies conducted by LSU AgCenter weed scientists have determined that fall applications should be made from Sept. 15 to Oct. 15 while environmental conditions favor weed growth (click here for more on this study).

For johnsongrass, bermudagrass and alligatorweed control, 1.0 lb ai/acre of glyphosate should be applied. Two lb ai/acre of glyphosate or dicamba are effective control options for redvine.

Glyphosate (2.0 lb ai/acre) plus dicamba (1.0 lb ai/acre) can also be an effective control option. Fields should be scouted the fall following herbicide application to determine whether an additional application is needed. Do not mow or till fields for several weeks following herbicide application.

Summary

Some weeds are capable of setting viable seed within 30 days after emergence during late summer and early fall. Post-harvest weed control is especially important when combatting glyphosate-resistant weeds such as palmer amaranth, waterhemp and johnsongrass. Problem fields should be identified and receive top priority for preventing seed return to the soil seedbank. Once harvested, these problem fields should be mowed or tilled shortly after harvest to prevent, or at least reduce, seed set.

Fields should then be regularly scouted for emerging weeds and additional control tactics applied prior to seed set. This will require close inspection of weed species to determine when they are flowering. Once a weed species is observed flowering, a weed control operation should be implemented. Depending on weather conditions following harvest, weed control tactics may need to be implemented every three to four weeks until a killing frost occurs. If glyphosate-resistant Palmer amaranth or waterhemp is an issue, a management tactic (i.e. mowing, tillage, herbicide application) should be employed every three to four weeks.

Budgets are typically tight in the fall, and spending additional money on weed control when no crops are in the field is difficult. But identifying fields in need of post-harvest weed management and by implementing field prep in a timely, well-spaced manner can go a long way in reducing future weed numbers in your fields. Below is a list of herbicides labeled for use following main crop harvest and for non-cropland use (ditch banks, etc.). Always read and follow label guidelines and restrictions.

Herbicides labeled for post-harvest weed control

- Glufosinate — Liberty 280 SL
- Enlist Duo
- Glyphosate — Roundup PowerMax
- Linuron
- Diuron
- Gramoxone 2 SL
- Aim
- Clethodim — control of annual and perennial grasses in land that was left fallow the previous year and other non-producing agriculture areas
- 2,4-D LV4 and 2,4-D Amine
- Clarity
- Banvel
- Xtendimax
- Outlook
- Prowl H2O
- Permit
- Distinct
- Dual II Magnum — Italian ryegrass (Sept. 1 to Dec. 1)
- Engenia
- Zidua
- Valor
- Sharpen

Herbicides labeled for non-cropland areas/farmstead use

- Aim
- 2,4-D
- Clarity
- Banvel
- Paraquat
- Goal
- Clethodim
- Xtendimax
- Prowl H2O
- Engenia
- Valor
- Sharpen
- Roundup PowerMax §

Corn hybrids for grain for 2019

BY DAN FROMME

This year, commercial corn seed companies provided 51 hybrids that were entered in the official variety trials. Five hybrid trials were conducted at four LSU AgCenter research stations. Commercial seed companies voluntarily entered and selected the hybrids they wanted the AgCenter to evaluate.

In addition to research station tests, on-farm core block demonstrations were conducted with a total of 11 hybrids at 16 locations in corn-growing areas of Louisiana. AgCenter extension agents coordinated these demonstrations.

The official corn hybrid trials were conducted according to AgCenter best management practices. The core block demonstrations were placed with corn producers and subjected to their standard production practices.

On-farm core block demonstration results provide yield results by trial as well as trend comparisons from the compiled data. As opposed to official variety trial research, core block demonstrations sometimes are not replicated in the field, and a rigorous statistical analysis is not possible. However, sufficient trials were conducted across a variety of locations; therefore, meaningful and relevant observations can be made that will be useful to Louisiana producers as they make hybrid selection decisions.

AgCenter corn hybrid trials provide the most complete and unbiased source of information on yield comparisons. The data provided in this publication should help you make more informed decisions about which hybrids will perform best for your production area. Click here to view the results. §

Check soil for compaction layers this fall

BY JOSH COPES, DENNIS BURNS, R.L. FRAZIER AND DAN FROMME

In the past couple of growing seasons, soil compaction has been a hindrance in many fields across Louisiana. Soil compaction is evident by observing reduced crop growth and development in fields and confirmed by inserting a penetrometer into the soil. Soil compaction is the compression of soil particles that reduces pore space, thus creating a dense layer of soil that can impede plant root growth.

Soil compaction can be caused by heavy machinery traffic and horizontal tillage operations when the soil is too saturated. There have been instances where a deep vertical till implement was used to alleviate a soil compaction layer only to create a new one less than 4 inches deep in the row middle when the rows were re-bedded. This was probably a result of re-bedding when the soil was too wet.

Soil compaction reduces crop rooting ability, restricts water infiltration rate, reduces the volume of soil that plant roots will be able to mine for essential nutrients and ultimately can reduce yield.

Machinery size is steadily increasing and will only lead to more frequent soil compaction issues. Silt loam soils are typically prone to compaction. There is perhaps a misconception that shrink-and-swell-type clay soils are not prone to compaction layers due to being "deep broke" as they crack open during periods of drought. Regardless, soil compaction layers have been observed in cracking clay soils.

Fields where soil compaction could be an issue can be identified by reduced crop growth rate, early-season nutrient deficiency symptoms and wilting of crops in certain areas of the field and not in others. Compacted areas can especially be identified during periods of cool weather early in the growing season when the crop develops at a reduced rate compared with the rest of the field with a similar soil type.

You can test for compaction layers by simply probing the soil (tops of beds or rows) in several areas of a field using a soil penetrometer. To mark the depth of the compaction zone, push the penetrometer down to the compacted zone and place a finger where the probe meets the soil surface. As a guideline, use the penetrometer when there is sufficient soil moisture for planting. Also, make sure that deeper soil compaction layers are not present.

To avoid soil compaction, limit field operations when soils are too wet. This can be difficult in Louisiana, but creating hardpans will reduce yield. Deep vertical tillage is the fastest method to alleviate soil compaction layers. Deep- or tap-rooted winter cover crops can also help loosen a compacted soil over time and may help prevent a compaction layer from occurring by increasing soil organic matter and maintaining soil structure.

Below are some photos taken this year in fields with compaction layers. Fields with soil compaction layers should be identified and deep broke this fall when soil moisture conditions are favorable to lift the soil so the hardpan can be disrupted. §

At left, J-rooted cotton due to compacted soil. At right, soil penetrometer reading in the same field. The reading was over 300 psi.

The depth of the soil compaction layer from the first two photos is shown at left. The photo at right, provided by Hank Jones, shows root restriction on Macon Ridge silt loam loess soil.

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
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