



THE LOUISIANA
Soybean & Grain
RESEARCH & PROMOTION BOARD

2026 REPORT

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Above: Chicken litter is composed of chicken excrement, spilled feed, feathers and the straw or other base materials laid on the chicken house floor. It has been used as fertilizer in some regions of Louisiana for several years. **Below:** In trials that compared fields fertilized with synthetic fertilizer and those with chicken litter, Leandro Vieira and his team planted side-by-side plots. The chicken litter treatment generally produced greater aboveground biomass. Photos provided by Leandro Vieira II

AgCenter researcher studies how chicken farm waste affects soil fertility

A chicken producer’s trash can often be a row-crop farmer’s treasure.

For decades, Louisiana growers near the poultry farming industry have relied on the litter scraped off the floor of chicken houses as a low-cost source of fertilizer for their fields.

Now, LSU AgCenter soil fertility specialist Leandro Vieira II has begun studying how this chicken litter improves overall soil health and increases fertility while also adding organic matter to the soil.

“With fertilizer prices the way they are now and the different issues that are causing those to rise, something like chicken litter that is available locally might be of even more interest,” Vieira said.

The litter is composed of chicken excrement, spilled feed, feathers and the straw or other base materials laid on the chicken house floor. Chicken litter contains nitrogen, phosphorus and potassium, which are the primary nutrients found in fertilizers, along with vital macronutrients calcium, magnesium and sulfur, Vieira said. It also includes several micronutrients that aid in soil fertility, such as zinc, boron, copper and molybdenum.

“So, it is very complete,” Vieira said.

Many producers that rely on litter as fertilizer have raved about its benefits. At the AgCenter Macon Ridge Research Station in Winnsboro, Vieira has begun trials

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From the
Louisiana Soybean and Grain
Research and Promotion Board

When the going gets tough, the tough get going. That is the world of soybean, corn, wheat and milo farmers in 2026. This year’s corn crop had an early planting window, only to be met by a late freeze causing widespread replanting. From there, many got soybeans planted on time and had some early success. That was met with drought in many areas, followed by a historic flood in some of our largest soybean growing parishes. Unfortunately, the market for wheat and milo has limited Louisiana’s planting of those crops in recent years, which means our funding to grow these opportunities is also limited.

Therein lies the value of sustained, applicable research and promotion. Even though our challenges are many, we have invested wisely as Louisiana row crop farmers over the decades of our checkoff to have yield-sustaining principles coupled with more nimble adaptations to lean on in challenging times.

The Louisiana Soybean and Grain Research and Promotion Board continues to look for ways to sustain long-term success. Last year, we established and awarded our first Professorship of Excellence in Soybean Research. We have funded a second professorship through the LSU AgCenter and look forward to awarding it in the coming years. While we maintain our typical budgeting decisions prioritizing applied field research, we saw an opportunity to put funds away for the asset that drives our value the furthest: people.

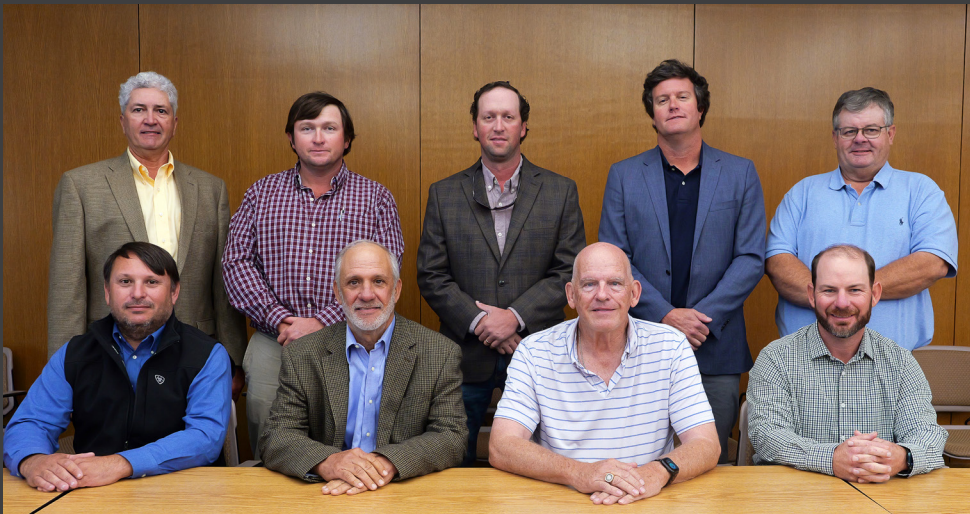
Through the soybean portion of our board, we operate under the United Soybean Board’s federal statutes for governance. This also gives Louisiana soybean farmers leadership opportunities to steward more than \$1 million Louisiana soybean dollars on a national research and promotion stage that adds up to more than \$100 million total nationwide. I want to recognize Garrett Marsh, LSGRPB member from Madison Parish, who will serve his final year of a nine-year term serving on USB. This volunteer time away from the farm is not easy to give, but he has made a real impact on trade, transportation priorities and setting USB leadership up for future success.

We need more like him and Joey Boudreaux, our other USB representative, to step up and lead. These dollars are from farmers and for farmers. Your chance to weigh in on their value — and adding value to our crops we pull the funds from — is waiting.

I served on USB. There are also opportunities within the National Corn Growers Association, U.S. Grains and BioProducts Council and the United Sorghum Checkoff. This network of farmer leadership needs more Louisiana voices, so please reach out to LSGRPB members or nominating organizations to learn more.

As we harvest another crop, plant the next and fight for profitability in between, know the LSGRPB covets your input on how to make our checkoff dollars go further, yield better and reach back to you as a contributing participant. We hope you find value in the projects in this report, and we look forward to working with you to better our livelihoods for the next generation.

Sincerely,
Charles Cannatella
Chairman, Louisiana Soybean and Grain Research and Promotion Board



Soybean and Grain Research and Promotion Board members front row from left, Joey Boudreaux, Charles Cannatella, Scott Wiggers Jr. and Wil Miller; and back row from left, Joey Olivier, Kody Beavers, Kellon Lee, Burch Pierce and Darrell VandeVen. Photo by Olivia McClure

Charles J. Cannatella Chairman Melville	Kellon Lee St. Joseph	Joey Olivier Arnaudville	Darrell VandeVen St. Joseph
Kody Beavers Extension	Garrett Marsh Tallulah	Burch Pierce Jonesville	Scott Wiggers Jr. Secretary-Chairman Winnsboro
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Redbanded stink bugs are major pests for soybean producers and can cause significant yield loss every year. Photo by Avery Williams

Emerging
insecticide,
stink bug host
research could
improve cost
and efficiency

On soybean farms around Louisiana, insecticides are used to manage and limit the populations of unwanted insects that cause severe damage to their crops. Few insects are more impactful than the redbanded stink bug, a small green pest that can cause millions of dollars of damage statewide.

To combat this, LSU AgCenter researchers have long-term tests to show which commercial insecticides are most efficient as well as the amount needed to have notable results. While these tests are important for farmers, there is rarely a change to the recommended chemicals used.

That changed this year when AgCenter researcher Dawson Kerns began testing isocycloseram, an insecticide with a new mode of action that seems promising in terms of both cost efficiency as well as lasting population control.

“We rely very heavily on a few insecticides and that puts us at high risk of the development of resistance,” Kerns said. “One of the biggest benefits of isocycloseram is that it provides a long residual control. It’s a premium product, but you get a lot of protection for a longer period.”

This will allow farmers to not need to apply insecticides as often, saving both time and money. While research has been going on for a few years around the country on isocycloseram, studies specifically on redbanded stink bugs are more limited to Louisiana, and the AgCenter will have more specific data and suggestions within the next few years for that chemical’s use.

Kerns and his team also have been looking into isocycloseram’s efficacy in tank mixes with other products against the redbanded stink bug.

Research also has been done by Kerns into the host preferences of the redbanded stink bug. The bug has been observed on crimson clovers early in the spring. But there is still a question as to what host the bug transitions to after this first stage and when they move into soybean plants.

“This trial is looking at alternative hosts for redbanded stink bugs and tracking their movement from different species of clover and then transitioning over to other species of legumes, before they move over to soybeans,” Kerns said.

There have been signs that point to the partridge pea as a likely transitional host, but the study is still in progress.

While redbanded stink bugs are a serious pest for soybean farmers, there are also beneficial insects that reside in soybean fields and feed on pests. To better protect these insects, Kerns has begun a trial to study the impact of all the commonly used insecticides, along with isocycloseram, on beneficial insects. **Anthony Bailey**

Plant-derived compounds show promise for soybean disease management



Above: Madaleine Alessi and Indira Poudel, graduate students in the Huang group, started the field trial for the 2026 growing season by using plant-derived molecules against *Cercospora* leaf blight. Inset: Seed coating with plant-derived lipid biosynthetic and metabolic inhibitors protects soybean plants infected by seed-borne *Cercospora* cf. *flagellaris*. Soybean plants grown from seeds with *Cercospora* cf. *flagellaris* inoculation. Photos provided by Chien-Yu Huang

As fungal diseases continue to challenge soybean production, researchers are working to develop new tools that help growers protect yields while reducing reliance on traditional fungicides. At the LSU AgCenter, Chien-Yu Huang, assistant professor in the Department of Plant Pathology and Crop Physiology, is leading a project aimed at developing plant-derived treatments to control major soybean diseases, including *Cercospora* leaf blight, frogeye leaf spot and aerial blight.

The three-year study is now entering into its second year and has already produced encouraging results.

The project focuses on naturally derived compounds that may provide a safer and more environmentally friendly alternative to conventional fungicides. According to Huang, the first year of the project centered primarily on seed treatments, which offer the advantage of protecting plants from disease with a single application.

Many soybean pathogens originate from infected seeds or pathogens that survive in the soil, making seed treatments an important first line of defense.

Huang and her research team evaluated many plant-derived compounds through laboratory testing, examining seed germination, emergence rates and disease severity. They observed promising results from some of the treatments, indicating their potential to suppress disease while maintaining healthy plant development.

Early foliar treatment studies were evaluating how these compounds might perform when applied directly to plant leaves.

“The first year we have collected some data really supporting some of our formulas for seed treatments, so this year so far we are focused on that,” Huang said.

Building on the success of the first year, Huang and her research team are now moving from laboratory studies into field evaluation. This growing season marks the project’s first field trial at the LSU AgCenter Doyle Chambers Central Research Station.

Based on first year lab results, Huang selected the most promising seed treatment formulations for field evaluation and will allow researchers to evaluate treatment performance under real-world growing conditions. The study includes three replicated plots to ensure accurate and reliable results.

Moving forward with the project into year three, Huang hopes to expand field trials across Louisiana to determine how the treatments perform under a range of environmental conditions and weather patterns. She understands the unique challenges that replicating field trials in Louisiana faces.

“Recently this year we had to push a little bit because it’s raining a lot this year, so our planting season, got a bit delayed for one or two weeks,” she said.

To advance the project into field testing, Huang partnered with Sara Thomas-Sharma, assistant professor in the Department of Plant Pathology and Crop Physiology, who designed the field experiment and oversees field management practices.

Huang also mentors graduate students who conduct laboratory testing, culture fungal pathogens and assist with field observations throughout the growing season.

The research addresses both primary and secondary sources of disease infection. Seed treatments are intended to prevent primary inoculum, pathogens carried on soybean seeds, while future foliar treatments could help control secondary inoculum spread from infected plants in the field. Huang is continuing to evaluate how long the plant-derived compounds remain effective under field conditions and how they may be incorporated into future disease management programs.

Ultimately, the goal is to develop a new disease-management product that is both effective and sustainable. Because the compounds being studied are derived from plants and many already have available safety information, they may offer an easier path toward regulatory approval while providing an eco-friendly alternative to conventional fungicides. Early results suggest it could become a valuable new option for soybean producers seeking effective ways to manage disease pressure and protect crop yields.

“There are several issues when we use fungicides to control fungal diseases, including fungicide resistance and concerns about synthetic fungicide safety,” Huang said. “We are trying to give growers another tool they can use in their toolbox.”

As the project advances from the laboratory to the field, Huang and her team remain focused on delivering practical solutions to future challenges. **Allie Hubbard**

Avoiding disease in crops starts early, all to avoid a late-season yield loss

Managing diseases is an evolving science. New diseases appear, old diseases reappear, fungicides change and the weather remains consistent by always changing year by year. All of these present challenges to growers and plant pathologists alike.

Early steps can help manage diseases in corn, soybean and other crops.

“The first step, and probably the most important step,” according to LSU AgCenter plant pathologist Boyd Padgett, “is choosing disease-resistant varieties and hybrids.”

And it makes perfect sense from an economical and time-saving perspective.

“Disease-resistant varieties and hybrids are generally no more expensive, but they can save time and money by potentially avoiding a fungicide treatment,” Padgett said.

In some years, disease outbreaks are limited, but in other years, outbreaks can be severe. The driver for these outbreaks is typically environmental conditions, with moisture and temperature being the biggest contributors for certain disease epidemics.

Padgett says newer fungicides are showing better efficacies, so there are some new tools in the toolbox.

“I’ve seen yields 20 bushels higher in fields with late-planted beans that had a fungicide applied in a timely and effective manner,” he said.

Padgett also said many producers spray crops, particularly soybeans, as a precautionary measure. This is an added cost that producers could avoid, especially if environmental conditions are not conducive to disease development.

“For example, if there is an extended dry period during flowering, you probably don’t need to treat,” Padgett said.

Since a fungicide application can run as high as \$20-25 an acre plus an application cost, a farmer could save a good deal of money and time by planting a resistant variety.

With depressed commodity prices, farmers are having to be creative when it comes to managing input costs. One way to reduce costs could be forgoing a seed treatment on soybeans. While research has shown they are effective, they typically do not pay for themselves and serve as more of an insurance policy during less-favorable growing conditions.

If diseases such as frogeye leaf spot, aerial blight or Cercospora leaf blight are severe enough to warrant a fungicide application, researchers have documented that products containing SDHI, or succinate dehydrogenase inhibitors, and/or newer triazole fungicides have been effective in helping control these diseases.

“These newer fungicides are tank-mix products that carry with them two or three modes of action,” said Trey Price, plant pathologist at the AgCenter Macon Ridge Research Station in Winnsboro. “This makes them more effective against diseases.”

Taproot decline is another problem that Price is examining. It is a problem for which coming up with an answer hasn’t been easy.

“There are a couple of in-furrow fungicides that are effective on taproot disease management,” he said. “However, most farmers do not want to use that type of application.”

Like Padgett, Price believes farmers need to find a resistant variety and rotate.

Price noted that taproot decline management is most successful when treatments are done at planting.

“It needs to be done at planting and through in-furrow applications,” Price said. “This is now somewhat unconventional, and growers have been reluctant to take this approach.”

Trying to grow agronomic crops in a state that has a subtropical climate presents many challenges, and plant pathologists are on the frontline looking for answers to the many questions regarding disease management.

Craig Gautreaux

2026 Soybean and Grain Research and Promotion Board-funded projects

Agricultural Economics and Agribusiness\$44,249

Developing an AI-driven Price Risk Management Tool for Soybean and Corn Producers in Louisiana, *Raghav Goyal, Hector Zapata and Michael Deliberto*

Economic Analysis of Farm Programs and Commodity Costs and Returns for Soybean and Grain Production in Louisiana, *Michael Deliberto*

Biological and Agricultural Engineering\$33,916

Improving Automatic Soybean Quality Analysis, *Kevin Hoffseth*

Communications\$7,500

2026 Soybean and Grain Research and Promotion Annual Report and Web Portal, *Frankie Gould*

Dean Lee Research Station\$306,612

Developing Soybean Disease Management Programs in Central and South Louisiana, *Boyd Padgett*

Developing Diseases Management Strategies for Corn, Grain Sorghum, Small Grains and Soybean in Central and South Louisiana, *Boyd Padgett*

Weed Control Strategies in Louisiana Feed Grains, *Stephen Ippolito*

Evaluation of Weed Management Practices in Louisiana Soybean, *Stephen Ippolito*

Enhancing Approaches to Insect Control in Field Corn in Central Louisiana, *James Villegas*

Refining Pest Management Strategies for Economically Important Insects in Louisiana Soybean, *James Villegas*

Management Strategies for Sugarcane Aphids and Headworm Complex in Grain Sorghum, *James Villegas*

Soybean On-Farm Demonstration Program, *David Moseley*

Louisiana Soybean Production Agronomic Best Management Practices: Decreased Risk and Increased Profits, *David Moseley*

Entomology\$112,916

Detecting Insect-Damaged Soybeans with Artificial Intelligence Solutions, *Ivan Grijalva*

New Tools and Tactics for Soybean IPM, *Jeff Davis*

Macon Ridge Research Station\$392,068

Insecticide Application Strategies for Stink Bugs in Soybeans, *Dawson Kerns*

Monitoring and Management of Stink Bugs on Non-Crop Hosts and Soybean, *Dawson Kerns*

Cost-Effective Soybean Insect Pest Management Strategies for Northeast Louisiana, *Dawson Kerns*

Evaluation of NDVI Use for Early Detection of Disease and Prescriptive Management of Fields Using Spray Drones, *Shelly Kerns*

Corn On-Farm Demonstration Program, *Shelly Kerns*

Chicken Litter as a Tool to Increase Yield and Soil Fertility in Louisiana Corn Fields, *Leandro Vieira*

Integrated Soybean Disease Management, *Trey Price*

Northeast Research Station\$60,000

Soybean Weed Management in Northeast Louisiana, *Donnie Miller*

Plant Pathology and Crop Physiology ...\$250,416

The Potential of Adjuvants and Nanoparticles in Enhancing the Effectiveness of dsRNA in Managing Soybean Fungal Diseases, *Zhi-Yuan Chen*

Identifying Weather Predictors Associated with Airborne Spores and Disease Outbreak in Cercospora Leaf Blight of Soybean, *Sara Thomas-Sharma*

Screening of Soybean Core Block Varieties for Resistance to Aerial Blight, *Sara Thomas-Sharma*

Implement Plant-Derived Natural Molecules to Manage Important Fungal Diseases in Soybeans, *Chien-Yu Huang*

Integrating Developments in Taproot Decline Pathology to Minimize Yield Loss, *Vinson Doyle*

Characterizing the Environmental Factors and Host Genetics that Influence CLB Disease Severity to Improve Epidemiological Modeling and Cultivar Selection, *Vinson Doyle*

Characterization and Validation of Reniform Nematode Resistance in Soybean, *Tristan Watson*

Nematode Associated Yield Loss and Damage Thresholds in Soybean and Grain Crops, *Tristan Watson*

Root-Knot Nematode Management in Soybean, *Tristan Watson*

School of Plant, Environmental and Soil Sciences\$112,000

Small Grain Breeding, Variety Development and Testing, *Noah DeWitt*

Integrated Weed Management Solutions in the Absence of Dicamba for Mitigating Herbicide Resistance in Louisiana Soybean and Grain Crops, *Prashant Jha*

Total Funding for 2026: \$1,319,677

New resistant varieties prove challenging for nematode management in soybeans

Nematodes are microscopic roundworms that feed on plant roots, which reduces yields and poses a financial burden on producers. Tristan Watson, a nematologist and associate professor in the LSU AgCenter Department of Plant Pathology and Crop Physiology, has been working tirelessly to combat the pest.

Watson has been evaluating soybean varieties for resistance to the reniform nematode, which he estimates is in more than 50% of Louisiana soybean fields. He says he hopes to make recommendations to growers soon.

“We’ve already demonstrated that deploying experimental soybean varieties with host resistance can reduce reniform nematode populations and improve yield in our prior studies,” he said. “Now that reniform nematode-resistant soybean varieties are beginning to become commercially available to growers, we are shifting our focus to evaluating these new varieties for suitability as a nematode management tool in Louisiana.”

According to Watson, in 2025, the reniform nematode was responsible for a 1.25% reduction in Louisiana soybean yields. This amounted to a loss of more than 500,000 bushels and \$5.8 million.

The reniform nematode is known to reduce the size of soybean root systems but does not cause obvious root deformation like other nematode species. Thus, it can be challenging to diagnose infestations, Watson said.

One way to spot a reniform nematode infestation is high variability in plant height, which gives rows a wavelike appearance. While most other nematodes have a patchier distribution, the reniform variety tends to be more broadly dispersed in infested fields.

“Although the overall damage on an individual plant is only moderate under severe infestations and rarely causes plant death, the cumulative impact of reniform nematode feeding across an entire field can cause serious yield losses for Louisiana growers,” Watson said.

Watson said that, in a related project, doctoral student Lucy Kiarie has identified new genetic regions in the soybean genome associated with reniform nematode resistance which can be utilized by soybean breeding programs around the country to develop new resistant varieties.

Another major threat to Louisiana soybean production, according to Watson, is the southern root-knot nematode.

Watson believes a multifaceted approach is crucial to managing this highly damaging nematode. He’s studying new nematicide chemistries and application methods to help protect young soybean roots from nematode feeding. With help from AgCenter soybean specialist David Moseley, he has set up trials across Louisiana to evaluate new resistant varieties.

“Although numerous soybean varieties are advertised as root-knot nematode resistant, most of these varieties only help to protect yield in infested fields and do



Above: The severely stunted plants and death of young seedlings in a patchy distribution are signs that this experimental plot at the Northeast Research Station in St. Joseph is infested with the root-knot nematode. Below: An experimental plot at the Northeast Research Station in St. Joseph is infested with the reniform nematode showing stunted plant growth, giving rows a wavelike appearance. Photos provided by Tristan Watson

not actively reduce nematode numbers,” Watson said. “This is a problem because growers then have to plant into a field with a high potential for root-knot nematode problems the next growing season.”

The southern root-knot nematode is present in about 15% of soybean fields in the state, Watson said. It causes root galling, severely stunts plants and can eventually lead to plant death.

The southern root-knot nematode diminished Louisiana soybean yields by 2%, or approximately 875,000 bushels, in 2025. That translates to an economic loss of about \$9.3 million.

Iris Aguilar, a doctoral student, is playing a key role in this project. She is evaluating which combination of resistant soybean varieties and nematicide chemistries provide the best protection from nematode damage. **V. Todd Miller**





Above: Entomology graduate assistant Chancy Sibakwe sweeps a soybean plot searching for insects at the LSU AgCenter Botanic Gardens at Burden. Photo by Avery Williams. Top right inset: A sprayer drone flies over a soybean field at the LSU AgCenter Dean Lee Research and Extension Center. AgCenter researchers are investigating the use of sprayer drones for insecticide applications on soybeans. Bottom right inset: LSU AgCenter entomologists are taking a multipronged approach to manage soybean pests such as the redbanded stink bug. Photos by James Villegas

Researchers develop new strategies in fight against soybean insects

When it comes to managing insects, soybean producers have to control an insect complex. It's not just one main insect. It's stink bugs, three-cornered alfalfa hoppers, corn earworms and other caterpillars.

So, LSU AgCenter entomologists are taking a multipronged approach to integrated pest management in soybeans starting with understanding insecticide resistance, which remains one of the greatest challenges for growers.

LSU AgCenter entomologist Jeff Davis' research shows that redbanded stink bugs exhibit behavioral resistance by avoiding insecticide exposure.

"This insect feeds in the lower canopy. It lays its eggs lower in the canopy," Davis said. "It avoids the insecticides because when we spray in a field, the insecticide reaches about the top third, and it pretty much lives in the bottom two-thirds."

These insects also seem to have metabolic resistance. They can break down insecticides faster than our native stink bugs. He is also trying to understand if the redbanded stink bug's exoskeleton protects it more from insecticides.

"We don't know if it has a tougher exoskeleton or more waxes that protect it. So that's some research we're doing, trying to understand the actual mechanisms around that," he said.

Davis and entomologist James Villegas are looking at new insecticide options and insecticidal seed treatments.

Villegas is evaluating the efficacy of insecticidal control strategies, including different application rates, combinations and timing, targeting key insect pests, specifically redbanded stink bugs, soybean loopers, corn earworms and fall armyworms.

Redbanded stink bugs continue to be the major pests of soybeans in Louisiana. Villegas said the state has the highest incidence of redbanded stink bugs in the Midsouth. He is evaluating a new insecticide, Vertento (isocycloseram), to help manage this and other pests. He said it seems promising and can last longer in the field.

"It has a lot longer residual than other products that we have in the market," Villegas said. "If you time it right later in the season, you can eliminate a spray before harvest."

Costs can be prohibitive with some of the new insecticides. Villegas' research focuses on the importance of aligning management decisions such as seed treatments and insecticide applications with historical pest pressure in specific fields so farmers can make the most economically sound decisions.

The researchers are also looking for products that won't harm pollinators but are active against stink bugs. They are testing experimental compounds and combinations of available insecticides to extend control.

With insecticides, there is also the question of how best to apply them. Villegas is researching the use of sprayer drones for insecticide applications on soybeans. He is working with LSU AgCenter engineer Randy Price. They established field plots at the Dean Lee Research and Extension Center, and trials have shown drones can be as effective as traditional application methods such as sprayer rigs and planes.

"There is an increasing number of producers that also use sprayer drones in their field," Villegas said. "The idea for this is for us to really look at what would be the best way to put out the products to control your target insects in soybean."

The researcher is looking at optimal flight heights, nozzle types, spray rates (GPA), and insecticide classes. He has found flying between 10 to 15 feet above the canopy and higher GPA is where you see a lot better control.

"Our goal is to continue building baseline data on drone-based application strategies and their effectiveness in managing insect pests."

Another project is looking at how production practices can affect pest pressure. Davis is researching how the use of paraquat as a harvest aid may influence insect damage. He found that as the soybean plants dry down, pods may become more appealing to insects.

"You're breaking down that physical barrier, and the plant is no longer actively defending itself," Davis said, adding that it could increase sugars in the plant. "If paraquat mobilizes sugars, we could actually be making those soybeans more attractive to insects."

Davis is also investigating the unintended consequences of insecticide use at the system level. His research suggests that some insecticides used to control caterpillar pests may actually stimulate stink bug populations, increasing reproduction and survival under certain conditions.

The phenomenon known as hormesis may show that when an insect is exposed to a stressful situation, such as a low nonlethal dose of an insecticide, the insect may actually produce more progeny.

"Think of it as that which doesn't kill us, only makes us stronger," Davis said.

Davis noted that he is always thinking broadly in a whole-system-levels approach to integrated pest management to get the best results for soybean growers. **Tobie Blanchard**

Leaf size, varieties, product claims among AgCenter soybean research efforts

Farmers planted almost 800,000 acres of soybean in 2025, and LSU AgCenter research is important to identifying high quality soybean varieties and establishing cultural practices that may lead to maximum yield.

AgCenter soybean specialist David Moseley spearheaded official variety trials (OVT) for 68 varieties. Additionally, there were 25 core-block variety trials in 11 parishes for 2025-2026. Data from those trials were published in the LSU AgCenter 2026 Soybean Variety Yields and Production Practices publication.

“It’s important for farmers to check the new book each year,” said Moseley. “We keep evaluating to see which ones have the highest yield and work across the most acres and environments.”

In the most recent trials, the top variety yielded 5% more than the average variety, according to Moseley. For the maturity group 4.5 to 4.9 core block, the top three yielding varieties had above average yield for most of the locations.

Additionally, Moseley has begun a unique study analyzing planting date by leaf shape. A soybean near-isogenic line was recently developed that had only one genetic difference with the parent — a narrow leaf, instead of the traditional broad one.

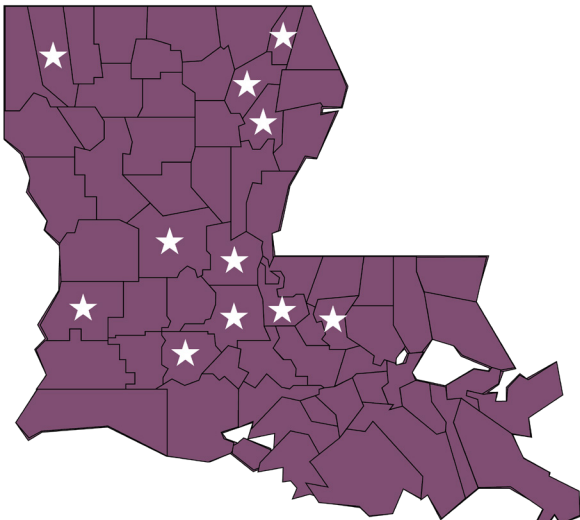
“There’s an idea that we’ve actually developed too much vegetation and possibly that’s why we’re seeing green stem,” said Moseley. “Also, maybe too much foliage means we use more water than we need, or it blocks air flow, increasing disease pressure.”

“Could less vegetation on the narrow leaf be an advantage?” asked Moseley.

Moseley’s team has been evaluating multiple foliar applications that companies are alleging mitigate stress and increase yield. The tests are being conducted at the Dean Lee Research and Extension Center in Alexandria.

“I’m just doing research to either confirm or reject claims these products are making a difference,” said Moseley. “If something is working, I want to find it and let farmers know what it is.”

Researchers are able to do multiple replicated small plots at the research station but would not be able to test that many products on the farm.



Soybean core block locations

Acadia, Avoyelles, Beauregard, Bossier, East Baton Rouge, Franklin, Pointe Coupee, Rapides, Richland, St. Landry, West Carroll

“If we see something that’s working at the station, we can scale it up to the farm,” he said. “Without that, we just wouldn’t be able to look at enough products and wouldn’t be able to replicate it for data and analysis. That’s the power of the research station.”

LSU AgCenter soybean scientists are also participating in several national soybean trials with Science for Success, a group of university researchers from different states.

In one, researchers are investigating different planting dates: earlier than optimum, optimum and later than optimum. After three weeks, more soybean is planted in the lower than optimum group.

“So we can see if replanting was economical or if we didn’t need to replant,” said Moseley.

Moseley has another trial, not part of the national study, focusing on planting date by population without any replanting. He has also begun on-farm trials with granular and foliar potassium fertilizers, basing these on soil tests.

AgCenter researchers tested a non-paraquat harvest-aid product to measure the most economical timing of application. They found it can help with



A recently developed soybean line with less leaf growth (right) compared to a standard size leaf (left). The LSU AgCenter has recently begun a study of soybean plants with different leaf sizes.



Soybean trial that uses replants in certain fields, as part of wider research investigating the outcome of different planting dates. Photos by David Moseley

green stem, it did not decrease seed quality, nor did it decrease yield when sprayed at R7.5 growth stage, said Moseley.

The Science for Success group is also working on developing a tool that could help resolve problems like “hidden hunger,” where asymptomatic potassium deficiency causes decreased yields.

“The tool would allow you to know how much potassium to put on in-season, based upon your leaf tissue analysis,” said Moseley.

“You work together with other states and, instead of having one field or two, you have multiple fields across the nation,” Moseley said. “That data is so much more powerful.” **Randy LaBauve**

On-farm variety trials continue to provide valuable feedback to researchers and growers

More than a century ago, Seaman A. Knapp saw the value of doing demonstration work in agriculture. That tradition continues across many states, and Louisiana is no exception as demonstration plots are conducted on many crops, including corn and soybeans.

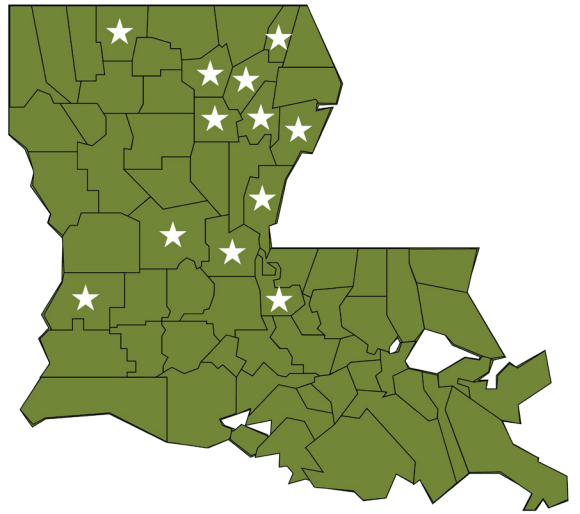
Shelly Kerns, LSU AgCenter corn, grain sorghum and cotton specialist, coordinates on-farm corn hybrid variety trials. She works with area agriculture and natural resources agents in selecting sites, and the agents help plant, harvest and collect the yield data. This year, she planted 13 trials in 12 parishes across the state.

Kerns said she is testing 10 hybrids in her on-farm tests.

“I was excited to include Claiborne Parish this year,” Kerns said. “It’s not one of our traditional corn-producing areas, so it will be interesting to see how it performed when the final data is analyzed.”

Weather is a factor every year when conducting research, and in 2026, the weather played a role in the very beginning.

“We got that big freeze on March 17, and that severely affected corn plots all across the state,” she said. “We were not immune to it, and we lost the trial in East Carroll Parish.”



Corn core block locations

Avoyelles, Beauregard, Caldwell, Claiborne, Concordia, Franklin, Ouachita, Pointe Coupee, Rapides, Richland, Tensas and West Carroll.

Because of the freeze, corn seed became scarce as farmers were scrambling to replant. Some farmers were unable to secure any seed, and corn acres became soybean or cotton acres.

The freeze stressed some of her other plots, but they remained viable and are going to be included in the Corn Hybrids for Grain publication, which is published in the fall and can be found on the AgCenter website.

“It could provide us some insight as to what effect early stress, such as the freeze, can have on certain hybrids compared to others,” Kerns said.

At the Claiborne demonstration plots, Kerns is investigating how the plants respond to chicken litter that was incorporated into the soil, which is somewhat unique for these trials. Kerns just started examining the crops for disease, including northern corn leaf blight, southern rust and Curvularia leaf spot, a disease that has seen a rise in recent years.

“All of the disease ratings will be included in the final report for growers to examine,” she said.

Another unique component of the on-farm demonstration plots is that they are managed by the farmers, meaning the cultivation techniques can be similar in some ways and different in others.

“We are going to be looking at many aspects of production with each of these trials,” Kerns said. “Are they irrigated or nonirrigated? What were the fertilization rates and how were they split? What soil types were they grown on? And others. All of this should provide us some very useful information.” **Craig Gautreaux**

Wheat struggles, breeding advances mark 2026 season



The 2026 growing season will be remembered as a challenging one for Louisiana’s wheat farmers. The St. Patrick’s Day weekend brought a late-spring freeze that severely damaged a significant portion of Louisiana’s wheat crop and many of the LSU AgCenter’s breeding trial plots in Winnsboro. The cold weather wasn’t good news for growers, but for AgCenter scientists working to breed better, more resilient wheat varieties, the freeze provided valuable data.

“The past few years have been favorable to lines with an early maturity habit,” said AgCenter small grains breeder Noah DeWitt. “This freeze event helped us eliminate lines with a too-early habit that will be punished in years with late freeze events.”

Breeders evaluate thousands of plots of experimental lines every year, trying to narrow them down to the plants most likely to perform best on Louisiana farms. Only a handful of lines are good enough to be released as varieties.

This year, the AgCenter planted thousands of wheat and oat plots and 1,500 triticale plots at LSU AgCenter Macon Ridge Research Station in Winnsboro, the LSU AgCenter Ben Hur Farm in Baton Rouge, and the LSU AgCenter Dean Lee Research and Extension Center. Also, there were increase strips for 100 wheat breeding lines and 40 oat breeding lines.

DeWitt said the breeding program collects data on a number of wheat pathogens, including leaf rust, stripe rust and fusarium head blight (scab) to guide decisions on developing resistant wheat varieties.

Another focus is how well wheat lines stand up to insect pressure. Trials in both the normal wheat yield plots and a specialized Hessian fly nursery at the AgCenter Doyle Chambers Central Research Station in Baton Rouge saw strong Hessian fly pressure this year. The insect also was present at an on-farm variety trial in Somerset in Tensas Parish.

Harvest of trials in Alexandria, Winnsboro and Somerset went well, DeWitt said, but he was unable to collect yield data on trials in Baton Rouge due to rain events and insufficient chilling hours during winter.

The breeding program made strides in several areas in the past year, including:

Progress on “speed breeding.” Last year, the first set of new wheat crosses spent two generations in a refrigerated shipping container used as a growth chamber. This saves two years of time in the breeding process. “The first set of these populations, consisting of siblings from the same cross, were planted in Baton Rouge,” DeWitt said. “Selections were made on the basis of leaf rust and Hessian fly resistance and maturity.”

Promising performance from LA 19-31. Last year, the AgCenter released LA 19-31, a medium-maturity wheat for Louisiana and the Southeast that combines excellent yields with strong disease resistance. Its resistance held up in this year’s trials, and yield data is encouraging so far. The variety will be available from UniSouth Genetics as USG 3437 with initial seed sales this year and greater availability next year, DeWitt said.

Triticale variety development. DeWitt expects to release a medium-late triticale variety for use as a cover crop and forage. Representatives of regional seed companies visited the AgCenter’s plots of triticale, which is a hybrid of wheat and rye. **Olivia McClure**



Above: Triticale test plots at the LSU AgCenter Doyle Chambers Central Research Station in Baton Rouge. Left: Noah DeWitt, LSU AgCenter small grains breeder, speaks during a field day at the Macon Ridge Research Station on April 16. Photos by Olivia McClure

Researcher tracks pests, tests treatments in corn, grain sorghum

LSU AgCenter entomologist James Villegas is helping manage insects across corn and grain sorghum.

In corn, Villegas' work evaluates seed treatments for early-season pests such as wireworms and sugarcane beetles. His findings suggest these treatments are most valuable under favorable pest conditions but may offer limited benefit when insect pressure is low.

"When the condition is good and pest levels are low, the seed treatments are not as necessary," Villegas said. "When conditions are favorable for pests, that's really where you get a lot of return."

He is conducting field trials to compare corn hybrids containing pyramided Bt proteins for

resistance to stalk- and grain-feeding pests. He is measuring pest infestation levels, plant injury, ear damage and overall yield performance.

Villegas is also monitoring the corn leafhopper, an invasive pest found in Franklin Parish in 2025.

"We're really on high alert not just because it could damage seedlings, but because it's a vector for disease, which is as damaging as its direct feeding," he said.

In grain sorghum, Villegas is in his third year evaluating foliar insecticides against sugarcane aphids and looking at insecticide efficacy in managing headworm complex. He plans to collect sugarcane aphid populations for use in insect bioassays.

In 2025, field plots were set up at the Dean Lee Research and Extension Center to test insecticides

against sugarcane aphids. With very low aphid populations, Villegas couldn't collect data.

"I'm planting grain sorghum in between corn just to increase the possibility of getting those corn earworms from corn to go to grain sorghum so that they could put out an efficacy trial for the headworm complex," he said.

He also has some grain sorghum planted in weedy areas to increase the possibility of sugarcane aphids and to be able to check whether there is efficacy of the products for sugarcane aphids.

"So far, it has been very hard to put out trials for grain sorghum just because the pressure is not there." **Tobie Blanchard**



LSU AgCenter researchers are working to manage pests in corn and grain sorghum such as, from left, corn earworm, sugarcane beetle and sugarcane aphids. Photos by James Villegas

Research into dsRNA to improve effectiveness, longevity of treatment

Soybean farmers use fungicides every year to protect their crops from diseases like soybean rust or leaf blight that damage their crops or yield. While these chemicals are effective, they can also cause harm to the surrounding environment and be cost inefficient.

To rectify this, researchers have been studying how to use genetic information to repel fungi and other pathogens from infecting soybean crops. Using double-stranded RNA, or dsRNA, scientists have discovered a way to suppress the growth of the fungal pathogens that use the identical RNA as their genetic code.

At the LSU AgCenter over the past year, researchers including Zhi-Yuan Chen have investigated different nanoparticles to coat the dsRNA to make it not only more effective as an alternative to fungicides, but even more cost efficient. Chen has also tested using adjuvants with dsRNA, or chemical additives that are used to help keep dsRNA on the leaf during unfavorable weather conditions.

These adjuvants could also help with reaching a layer within a leaf that would more adequately suppress the pathogens beyond just on the surface where the dsRNA is applied.

"We are testing and trying to use certain organic compounds that can weaken the wax layer on the soybean leaves so they allow them to penetrate into the leaves better," Chen said.

The dsRNA is only useful if it can interact with the pathogen it protects against, but if that pathogen gets inside the leaf, dsRNA on the waxy surface will have less of an effect.

"So, once they get into the inside of the leaves, you still have something there to slow the disease development. That way control can last longer, and less damage will be done to the leaves," Chen said.

Chen has also continued researching the impacts of adjuvants in extending the duration of dsRNA remaining on the leaf surface. Chen hopes to find a way to keep the dsRNA active and impactful on the leaf, while remaining a cheap and viable alternative.



Graduate student Sunira Marahatta in a field where dsRNA treatments are applied to soybean crops. Photo by Anthony Bailey

"We started from last year testing adjuvants," Chen said. "If the dsRNA doesn't stick to the leaf surface as tight as it should be when the rain comes, it will be washed off. So, we try to incorporate organic, oil-based adjuvants to make them stick to the leaf surface better." **Anthony Bailey**



Left: An example of johnsongrass infestation in corn crops. Right: An example of johnsongrass control by a Liberty-based treatment program in genetically modified corn. Photos provided by Prashant Jha

Proactivity, patience are key in combatting herbicide-resistant weeds

Soybean and grain crops are susceptible to invasions from winter annual weeds like Italian ryegrass early in the growing season, and perennial summer weeds such as johnsongrass all season long. Both are competitive with the crop for vital resources and, in the case of johnsongrass, can leave fields overgrown and difficult to harvest. Three LSU AgCenter researchers are working on solutions that include tips for producers at being both proactive and patient with herbicide applications.

Stephen Ippolito, Prashant Jha and Donnie Miller have been studying invasive grassy weeds for decades combined. Along with their graduate students, they have focused on a variety of tactics to improve yields for farmers in Louisiana and elsewhere. Lately, their research has focused on solving the problem of herbicide-resistant populations of these two weeds.

“We have started seeing johnsongrass resistance to glyphosate and ACCase chemistry, so there’s nothing much we can do postemergence other than Liberty and Capreno as a tank-mix,” Jha said. “And again, Liberty is a contact herbicide. It doesn’t translocate to the rhizomes, so that’s not the solution.”

Liberty is a nonselective, postemergent herbicide widely used to control tough broadleaf and grassy weeds but works only on the areas it touches and does not travel to roots. Whereas, glyphosate, the industry standard for years, is absorbed by the plant and moves through the plants into the roots.

Jha went on to say that, while a field may look good after a May application, when observed again in June, the plants could have died because the rhizomes are still alive, having not been affected by the Liberty application. Soil residuals like S-metolachlor or pyroxasulfone can be a good option to control seedling johnsongrass but will not do much to rhizome-derived johnsongrass plants.

Miller added that while historically Italian ryegrass control programs prior to crop planting have been built around glyphosate, the annual grass has become resistant to it over the years. Unfortunately, he emphasized the weed has also started to become resistant to effective alternative herbicide chemistries as well.

“Resistance has been documented in the past to both the ACCase and sulfonyleurea herbicides and most recently to paraquat,” Miller said. “So, we’ve just about run out of effective postemergence application options.”

Miller described the problem as being like a super virus that has been treated with the same medications for long periods of time.

“What the old medicine used to kill in susceptible populations isn’t even fazed anymore in resistant populations,” he said.

According to the researchers, one issue is that the introduction and widespread adoption of the Roundup Ready technology in the 1990s significantly slowed development of new herbicide chemistries over the past two decades in the agrichemical industry. Miller said that it can take 10 to 12 years at a minimum to develop a new compound and get it registered through the Environmental Protection Agency.

Alternative strategies, such as cover crops like cereal rye, can be effective at reducing the in-season selection for postemergence herbicides, according to Jha.

“Planting cereal rye, with the fall residual herbicide applied after emergence, provided us with the 90% to 95% control,” he said.

Miller said the combination of herbicides such as S-metolachlor and fall-planted cover crops as weed combatants is slowly catching on with producers because it’s a bit of a foreign concept. So, it is incumbent on the experts to keep promoting the benefits of the combination as a control method.

For his part, Ippolito has been working with trifluralin, a widely used, selective preemergence dinitroaniline herbicide, specifically in the realm of johnsongrass control.

“I intend to expand that a little bit out as well. I’ve been doing some work looking at kind of a heavy preprogram just to see if anything else has some activity,” he said.

Ippolito went on to say that a preemergence application followed by a postemergence application, regardless of the crop, is vitally important for resistance management. He said preemergence applications reduce selection pressure on postemergence applications.

Jha echoed his sentiments saying that, while it may not be cost-effective today, in the long-term growers need to be proactive and patient in managing herbicide resistance.

“Those who have been proactive, they’re going to make more money at the end of the five years as compared to those who aren’t,” Jha said. “We may have limited tools, but we have to figure out the best way to use them.”

V. Todd Miller



Plant pathology graduate student Geona Miles, left, waters soybean seedlings in a growth chamber while talking with research intern Catherine Wilson. Photo by Olivia McClure

LSU AgCenter researchers advance fight against taproot decline

LSU AgCenter scientists are continuing to unravel what was once termed a “mystery disease.” Now known as taproot decline, the disease hinders root development of crops. In Louisiana, infestations are most often seen in soybeans, killing some plants and robbing others of yield.

AgCenter plant pathologist Vinson Doyle has spent the past few years learning about taproot decline and the pathogen that causes it, *Xylaria necrophora*. Recently, he and master’s student Geona Miles have been refining inoculation procedures and setting up trials in controlled environment chambers. These advancements are allowing them to search for germplasm that may be resistant to *X. necrophora* and to document the susceptibility of different soybean cultivars.

It is believed that plant debris in fields helps spread taproot decline. Doyle, Miles and research intern Catherine Wilson began trials this summer investigating how quickly soybean and corn debris colonized by *X. necrophora* decomposes and how long it is capable of infecting crops. They’re burying both colonized and uncolonized debris in 3D-printed cages and plan on examining it every three months.

“By establishing baseline decomposition rates, we can ultimately look at practices that might speed up decomposition or otherwise modify debris so that it no longer serves as a source of inoculum,” Doyle said.

Another important development has come about through a partnership with Michigan State University. The collaborators have developed a molecular assay to detect *X. necrophora* in soils and debris — potentially making it easier to gauge the degree of infestation in grower’s fields.

Doyle is encouraged by the progress he and his team have made in the past year.

“If we are able to identify less-susceptible cultivars, we will have tools to predict disease pressure and mitigate its impact,” he said. “We have looked at host responses to increasing inoculum pressure in lab trials and see that as the amount of inoculum in the soil increases, the energy that plants are devoting to defense — rather than growth — increases. This suggests that even moderate reductions in infested debris can lead to a reduction in disease severity.”

Olivia McClure



1. Plant debris and the 3D-printed cages it will be buried in as part of a study related to taproot decline disease. 2. Plant debris inoculated with *Xylaria necrophora*, the pathogen that causes taproot decline disease. 3. Several varieties of soybean seedlings sit in a growth chamber. They are being studied for their resistance to taproot decline disease. 4. A soybean seedling inoculated with *Xylaria necrophora*, the pathogen that causes taproot decline disease, displays lesions and discoloration on its foliage. Photos by Olivia McClure

Improving soybean seed quality assessment using computer vision

Researchers at the LSU AgCenter are using computer vision and artificial intelligence to improve the way soybean seed quality is evaluated which they say could eliminate the need for time-intensive visual inspections.

Using high-resolution 2D images of soybean seed surfaces, researchers trained AI models to identify common defects that can affect seed quality. Types of defects include wrinkles, dark spots and other types of damage.

“Accurate seed quality assessment is critical for soybean producers, seed processors and researchers,” said Ivan Grijalva, assistant professor in the entomology department. “Our goal was to develop a model that can evaluate seed damage quickly and reduce the subjectivity of manual inspections.”

Thousands of seed images were collected and annotated. Researchers labeled visible damage on individual seeds, creating a dataset that trained the vision models to recognize and classify damage to the seeds.

According to Grijalva, building a high-quality training dataset was one of the most important steps in the process.

“Computer vision models require high-quality data to train them accurately,” he said. “By carefully annotating seed images and documenting different types of damage, we were able to create a strong foundation for developing reliable detection models.”

The team evaluated several computer vision approaches to determine which methods performed best. YOLOv8 and YOLO11 models were used for seed detection and counting. A U-Net model with a ResNet-34 backbone was employed for more detailed segmentation of damaged areas on seed surfaces.

Researchers also applied image preprocessing techniques, including image rotation and brightness adjustments, to increase variation within the dataset and improve model performance.

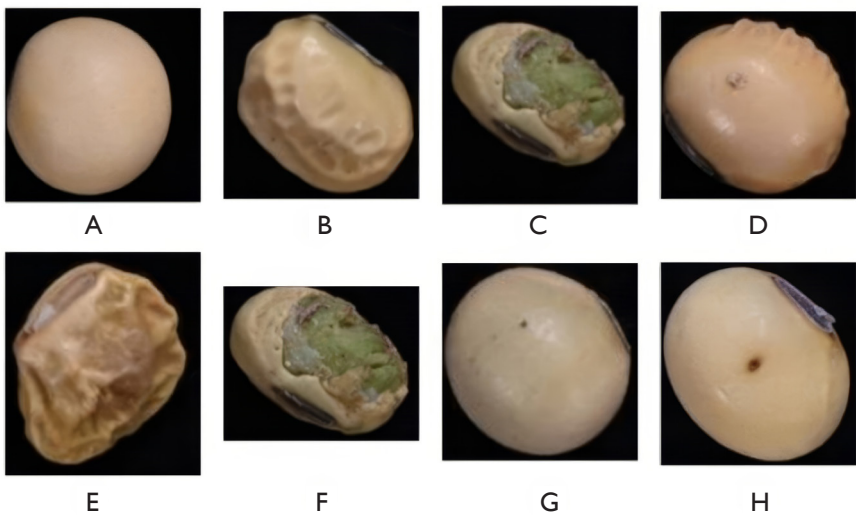
Grijalva helped guide model development and data analysis efforts, ensuring the team evaluated performance using standard performance metrics such as precision, recall and F1-score.

“We wanted to identify models that could perform reliably under practical conditions,” Grijalva said. “The evaluation process allowed us to find the best approach that balanced accuracy and consistency.”

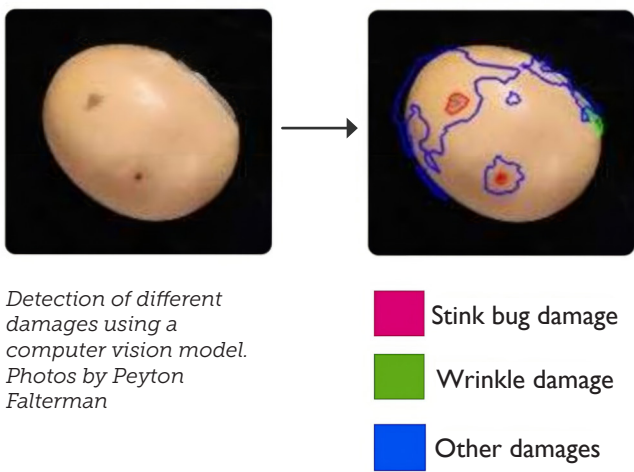
In testing, the selected model achieved approximately 82% accuracy in detecting and classifying seed damage.

The results demonstrate the growing potential of artificial intelligence tools in agricultural quality assessment, according to Grijalva.

The research team plans to incorporate the model into a decision-support tool that could eventually be used in automated seed grading systems. **Shelly Kleinpeter**



Soybean seed images with different surface damages were used to train AI models. Various defects include: A) undamaged seed, B) wrinkle with dark spot damages, C-F) multiple damages, G-H) dark spot damages.



Detection of different damages using a computer vision model. Photos by Peyton Falterman

Economists develop AI tools to help improve profitability, manage risk

Three LSU AgCenter economists in the Department of Agricultural Economics and Agribusiness are working on projects to provide tools that aid producers in making important estimations.

Raghav Goyal, Hector Zapata and Michael Deliberto are working on a project to develop an AI-driven price risk management tool for soybean and corn producers in Louisiana.

In researching and developing market intelligence tools for soybean farmers, the team members aim to give producers the ability to determine break-even price levels relative to seed variety, soil type and irrigation practice.

“Successful farming requires not only high productivity but also market intelligence,” Zapata said. “Our goal with this project is to help farmers manage the economics of production and futures market prices through simple-to-use AI-based decision tools.”

This project will create more accessibility for producers to protect and improve their operations. Daily fluctuation of prices makes establishing individual marketing plans difficult, but discovering a market and break-even price helps reduce risk and determine a plan.

“By incorporating different break-even price levels from different tracts or farms, producers can use price discovery from the tool as criteria to identify price targets in their marketing plan,” Deliberto said. “This can act to mitigate risk.”

Louisiana producers will be able to freely access the platform through the LSU AgCenter Extension network. By inputting their individual cost-of-production data, they can receive real-time calculations based on futures prices. Extension agents will be available to assist in setting up and interpreting these personalized marketing plans.

“The goal would be to come up with a foundational tool which would be developed based on all the history of data that we have,” Goyal said. “The farmers will give feedback to extension agents, and extension agents will give that feedback to us, and we’ll use that feedback to improvise these tools and make it more efficient.”

Deliberto is leading another project aimed at helping soybean producers with an economic analysis of farm programs, commodity costs and returns.

The goal is to provide farmers with tools to input their individual data to manage and track costs, evaluate agricultural policy and tailor crop insurance and farm program selections to mitigate risk to their operations, Deliberto said.

Agricultural policy largely affects producers through fluctuation in production costs, commodity prices and fertilizer and fuel prices. The implementation of an actionable policy via the One Big Beautiful Bill Act improved the farm safety net, Deliberto said.

Producers will be able to use these tools and tailor them to their own data inputs and receive different cost structures, break-even targets and desirable yield levels.

“They can use the tools that the AgCenter develops to help them just run different scenarios,” Deliberto said. “They have kind of a financial benchmark to show their banker to evaluate market and cost conditions for the upcoming year.”

Parish agents play a crucial step in the development of these tools. The feedback loop gives the AgCenter the ability to continually edit and tailor tools to the real-life practices and outcomes of production.

“The fact that they have the ability to be changed and tailored towards specific growers and specific crops really aids in that decision-making process,” Deliberto said. “Growers can have a true reflection of the cost per acre to do something with while trying to account for soil site disease pressure, fertility needs, irrigation, crop, etc.”

Providing these data sets that can be tailored to specific producers’ needs is important in determining the right plan for each farmer. The more accurate these tools can be, the better the AgCenter can provide support and mitigate risk to Louisiana soybean and grain production.

“We like to provide growers with as many reports and decision tools as we can,” Deliberto said. “To help them and give them the resources, so that they can make the best decision they can with seeing how these programs work, giving them the ability to run some different scenarios.” **Avery Williams**

Researchers look inside the soybean for hidden value

LSU AgCenter researchers are continuing to develop an imaging system to uniquely and quickly analyze soybeans with the objective of determining, among other things, potentially valuable qualities that have remained hidden during the inspection process such as oil and protein content.

Typically, damaged and disease-affected soybeans are marked as damaged during inspection and grading. But, this highly automated prototype imaging system, with the use of machine learning algorithms and shortwave infrared reflectance (SWIR) imaging, could help identify previously unrealized value and potentially open up a new avenue to analyze postharvest soybean quality for producers, inspectors, buyers and researchers.

“We’ve investigated different ways of essentially getting inside the soybean,” said LSU AgCenter engineer Kevin Hoffseth. “We found success building some machines to do the imaging, and we continue to refine and build new machines.”

The complex automated tabletop imaging system for soybean analysis is now in the patent application process. It not only depends upon quality lighting and camera technologies for image acquisition, but mechanical mechanisms to automatically move and position the soybean samples.

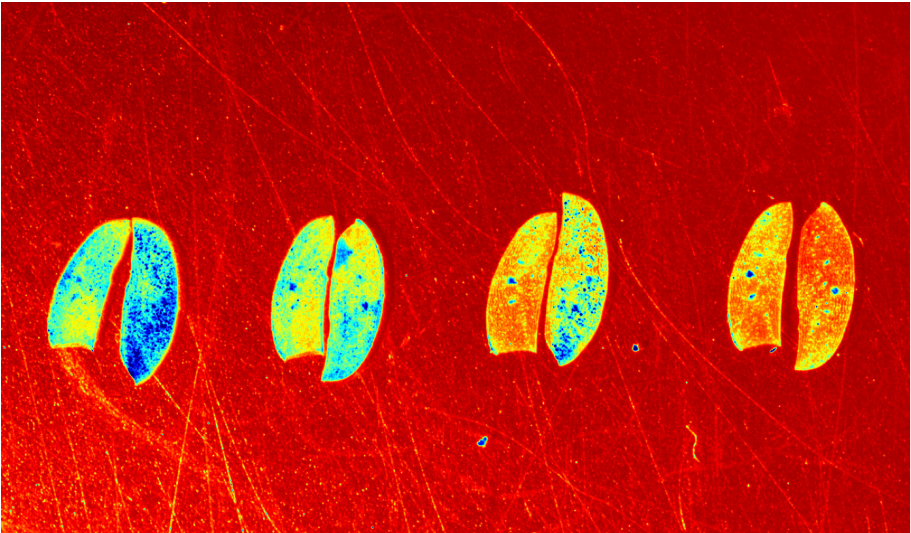
Additionally, this prototype includes algorithm-based, machine-learning functions built off a large database of diverse soybean images, including images of damaged and diseased ones, to consistently replicate accurate results for rapidly analyzing soybean samples.

“Along with trying to speed up the imaging in general, we’re then using different algorithms and numerical approaches to analyze it in different ways,” said Hoffseth.

“We put a lot of time into exploring imaging parameters and numerically, methodically evaluating them,” Hoffseth said. “We have been standardizing the automatic lighting and imaging for both visible spectra and infrared spectra.”

Building an effective image database of disease-damaged soybeans is crucial to the project, but it has created a challenge. Many farmers toss damaged soybean harvests, but Hoffseth and his team of researchers have gotten many of their samples from LSU AgCenter research stations throughout the state, and from helpful Louisiana farmers through assistance from the Louisiana Farm Bureau.

“One big focus is building and creating soybean grain image libraries, because you need that as the data to train new algorithms,” said Hoffseth.



Comparisons of reflectivity of cut soybean sections at a specific infrared wavelength shows spatial difference in magnitude, connected to oil and protein content. Photo by Hobbs McAllister

AgCenter station researchers could find the soybean-analyzing system useful for their future experiments, said Hoffseth. Large scale, in-depth analysis and measurement of grain-by-grain, postharvest single grain quality for crop research purposes has not always been done, because without an efficient automated process, it would be excessively time consuming and labor intensive to complete.

“Researchers treat soybean plants to target certain pests or disease. And then, my lab can come in and say, ‘Then how does that also affect the postharvest grain quality?’” he said.

Hoffseth said he hopes the technology can help create tools that farmers, buyers and inspectors can all use to consistently analyze soybean samples, while achieving the same results, in quicker time.

“We’re making really good progress on developing fundamental tools and methods that should play critical roles in next generation automation of grain grading,” he added. **Randy LaBauve**

LSU AgCenter adds four specialists for soybean grain research and extension

Stephen Ippolito

Stephen Ippolito is an assistant professor at the LSU AgCenter domiciled at the Dean Lee Research and Extension Center in Alexandria. He is an extension weed scientist with responsibilities in corn, cotton, soybean, peanuts, wheat and oats. Ippolito completed his bachelor’s degree at Willamette University in 2017 after which he went on to complete his master’s degree and Ph.D. under the direction of Katherine Jennings at North Carolina State University. He is working to develop new weed management strategies for controlling troublesome weeds in agronomic production such as prickly sida, johnsongrass and ragweed parthenium. His appointment is 75% extension and 25% research.



Anna Orfanou

Anna Orfanou is an assistant professor of agronomy at the LSU AgCenter based at the Macon Ridge Research Station in Winnsboro. Her research program focuses on optimizing agricultural management practices to increase crop productivity, improve resource-use efficiency and reduce operational inputs and costs. Her expertise in simulation modeling was developed through a combination of intensive field experimentation and predictive modeling research conducted during her doctoral and postdoctoral training. Orfanou earned her Ph.D. in crop and soil sciences from the University of Georgia, where she calibrated and validated the Decision Support System for Agrotechnology Transfer (DSSAT) CERES-Maize model for high-input corn production systems using extensive field data. She later expanded her modeling expertise during postdoctoral appointments at the University of Wisconsin–Madison and the Woodwell Climate Research Center, where she contributed to the advancement of the Agro-IBIS and RangeStar models, respectively.



Dimitrios Pavlou

Dimitrios Pavlou is an assistant professor and irrigation agronomist with the LSU AgCenter, based at the Macon Ridge Research Station in Winnsboro. His research and extension program focuses on improving irrigation scheduling, water use efficiency and nutrient management in Louisiana row crop systems through precision agriculture, advanced sensing technologies, decision support systems and simulation modeling. Before joining the LSU AgCenter, Pavlou served as a postdoctoral researcher at the University of Wisconsin–Madison, where he enhanced the capabilities of the Agro IBIS model to simulate turfgrass water dynamics. He earned his Ph.D. in crop and soil sciences from the University of Georgia, where he integrated field based measurements with crop and soil water simulation models to assess how different irrigation strategies influence yield and water quality outcomes in corn systems. Pavlou’s program combines applied field research with data driven tools to support producers and promote environmentally sustainable water management across Louisiana’s major cropping systems.



Leandro Vieira

Leandro “Leo” Vieira is an assistant professor and soil fertility specialist at the LSU AgCenter, based at the Macon Ridge Research Station in Winnsboro. Originally from Brazil, he grew up on a fourth-generation family ranch, which shaped his interest in agriculture. Vieira holds a bachelor’s degree in agronomy from the Federal Institute of Santa Catarina and Oregon State University, a master’s in soils and plant nutrition from the University of São Paulo, and a Ph.D. in soil and water sciences from the University of Florida. Prior to joining the LSU AgCenter, he worked as a postdoctoral fellow in conservation agronomy at Clemson University. His extension and applied research program focuses on soil fertility, nutrient management and soil health, with an emphasis on delivering practical, field-ready solutions that help farmers and consultants make confident decisions, optimize input use and achieve consistent, high-performing crops across Louisiana.





Spore traps placed around soybean fields in Louisiana include the Burkard spore trap (left), wind vane spore trap (center) and garden motor spore trap. These are used to monitor peaks of spores of the pathogens causing *Cercospora* leaf blight of soybean. Photos by Sara Thomas-Sharma

Cercospora leaf blight studies show promise after years of scientific work

For decades, scientists studying *Cercospora* leaf blight have sought to better understand the fungal disease that causes tens of millions of dollars in damage to Louisiana soybean crops each year.

A series of studies by LSU AgCenter researchers in recent years has answered many important questions.

Now, scientists can work toward two long-term goals: developing more precise recommendations for fungicide use and studying which varieties may carry resistance to the disease.

“It just took a lot of this foundational work to even know if it is worth it to do this kind of study,” said Vinson Doyle, head of the AgCenter Department of Plant Pathology and Crop Physiology. “We’ve finally gotten to that point.”

Cercospora leaf blight is the main foliar disease for Louisiana soybeans and is common throughout the Midsouth. The disease causes leaf yellowing, lesions on stems and leaves, and miscolored seeds and can lead to a yield reduction in soybeans.

Until recently, many thought that one *Cercospora* fungus species responsible for the disease was transmitted by seeds. A series of studies by Sara Thomas-Sharma, an AgCenter plant pathologist, proved that the fungus travels by spores through the air. Thomas-Sharma has led efforts to trap *Cercospora* spores in Louisiana and 20 other states and then examine the spores.

“*Cercospora* leaf blight is a very local problem in a sense that it is a Midsouthern disease problem,” Thomas-Sharma said. “It’s not considered a big problem in the Midwest in bigger soybean growing regions, but based on our spore trapping work across the U.S., it is detected almost everywhere.”

Doyle and other scientists have now identified more than 10 species of *Cercospora* throughout North and South America that can cause CLB. Another obstacle in studying *Cercospora* leaf blight was recently solved by a doctoral student in the AgCenter Department of Plant Pathology and Crop Physiology who found a way to infect plants with the fungus and reproduce symptoms in a controlled setting, Doyle said.

With these major obstacles cleared, Thomas-Sharma and Doyle can proceed with the research they have pursued for years. Over the past several years they have sought the resources and now have established a growth chamber facility at the greenhouses near the LSU Baton Rouge campus, where they can soon begin testing commercial soybean varieties and research breeding lines for resistance to *Cercospora* leaf blight.

“It seems like a simple question, an obvious question that you would answer, but there have been so many other foundational questions that we’ve had to deal with or problems that we’ve had to deal with to get to this point,” Doyle said. “Screening varieties for resistance for a lot of diseases is step one, but for this one, you couldn’t do it.”

Thomas-Sharma has also begun studying environmental conditions that contribute to the disease, both in soybean fields and in climate-controlled greenhouses. Not all plants that carry the fungus develop symptoms or lose yield, she said. Heat and humidity appear to create conditions needed for the disease to flourish.

“We don’t know if the conditions for the different species are different,” Thomas-Sharma said. “The ultimate goal is to try to figure out what environmental conditions might be associated with spore release in the field through greenhouse trials.”



Cercospora leaf blight is a disease caused by a fungal pathogen and has significant economic effects on soybean production. LSU AgCenter file photo

In the future, Thomas-Sharma, in collaboration with researchers across the U.S., hopes to create a predictive modeling system to allow soybean producers to better understand when to apply fungicides based on the risk created by environmental conditions and the likely presence of *Cercospora* spores. Similar tools for other crops exist on the Crop Protection Network website, a project created by a consortium of land-grant universities.

“There’s still a lot of testing before we actually recommend growers to change application timing,” Thomas-Sharma said. “We need to test to see if our predictions actually control the disease better.”

After much work, AgCenter researchers say they are eager to develop more science-backed recommendations that can help produce better crops.

“We’re much closer to understanding or predicting when disease outbreaks are going to occur and also identifying the genetic basis of resistance,” Doyle said. “The best tools are going to be finding resistant varieties. We’re finally at a point where we can do some of that work. I think we have much better prospects now than we did 10 years ago of really trying to figure out when farmers need to put their energy toward addressing this disease and when they can ignore it.”

New technologies and years of scientific breakthroughs have contributed to a promising future for *Cercospora* leaf blight studies, the researchers said.

“People have been working on this disease for a long time,” Doyle said. “Now we’re finally able to make progress, and much of that has come from support from the soybean board.” **Kyle Peveto**

Trials show limited soybean defense against aerial blight

Work is still underway to identify soybean varieties resistant to aerial blight. LSU AgCenter plant pathologist Sara Thomas-Sharma’s ongoing project screens plants in a greenhouse to improve disease management.

Last year, the project team screened 21 core block soybean varieties as a part of the annual variety trials and germplasm screenings. To assess their resistance to blight, they were grown in a controlled greenhouse setting.

“We did the trial twice, and none of the varieties showed up as being resistant,” Thomas-Sharma said.

There were concerns that the results from 2024 trials were influenced by cold temperatures, given that they were done in August and January. To minimize this possibility, the 2025 trials were run in July and September.

“This year there were no concerns that the temperature differences lead to inconsistencies in the screening,” Thomas-Sharma said.

The 2025 trial results suggest that there is overall little resistance to aerial blight in commercial soybean varieties.

Aerial blight is caused by a soilborne pathogen. It is difficult to monitor in a field due to its patchy distribution which is why Thomas-Sharma opts to use a greenhouse.

While no resistant varieties were identified, the research provides valuable insights for growers in high disease pressure areas and was published in the 2026 Soybean Variety Yields and Production Practices.

“Once a field has experienced this disease, there’s a good chance it will show up again because the pathogen survives in the soil,” Thomas-Sharma said. “These results can help growers compare varieties and choose options that may offer better protection.”

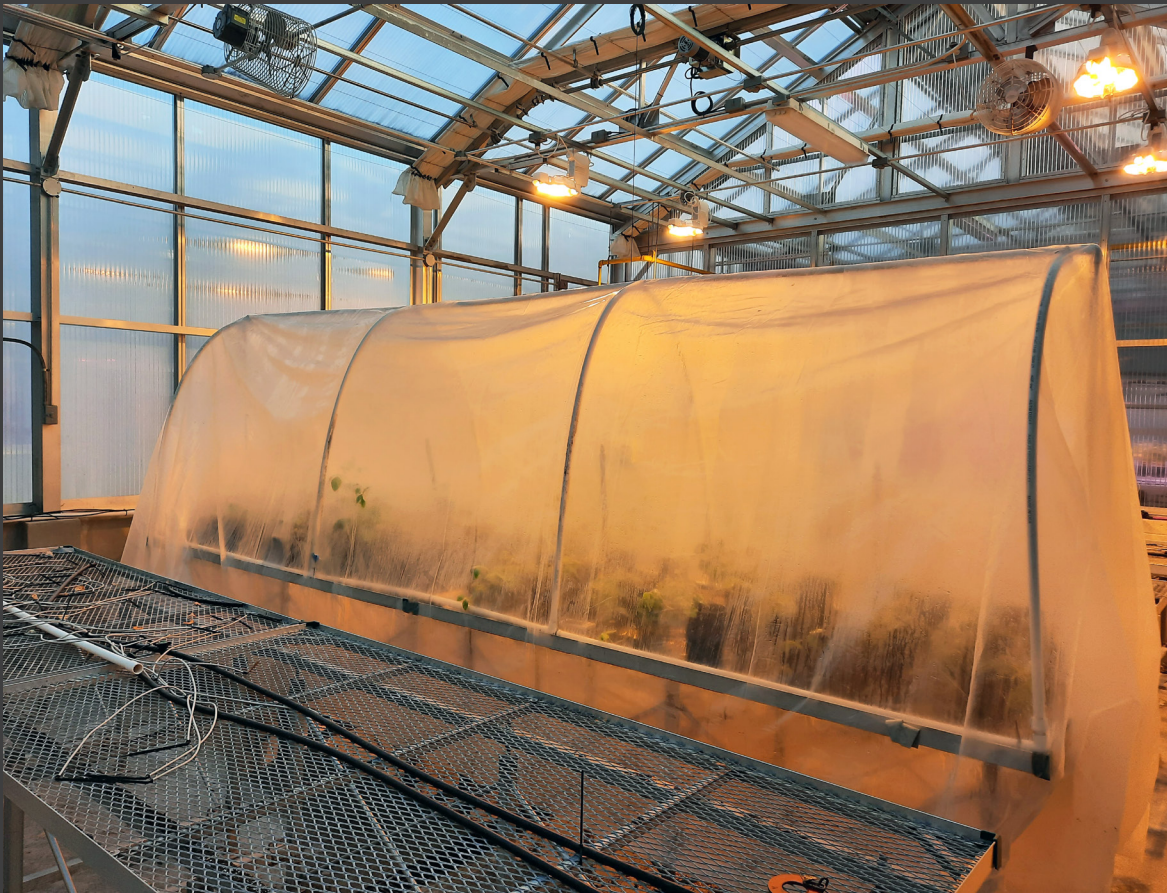
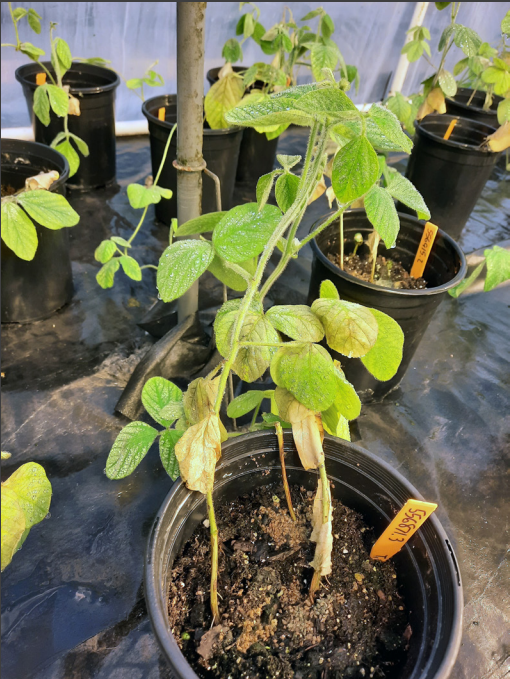
Fungicide resistance in the pathogen population adds a layer of complexity to disease management.

“Resistance to commonly used fungicides is a concern with this pathogen,” Thomas-Sharma said. “In a smaller study, we detected resistance, but additional research is needed to determine how widespread the issue is across Louisiana.”

Ultimately, the goal is to support integrated disease management.

“Effective disease management depends on using multiple approaches together rather than relying on one solution,” Thomas-Sharma said. “Selecting resistant is one of the most important tools growers can include in an integrated management program.”

Shelly Kleinpeter



Above: Soybean plants are housed in a humidity chamber in a greenhouse after inoculation to promote aerial blight infection and disease development for research purposes. Photos by Jonathan Amie

Left: A soybean plant displays aerial blight symptoms following inoculation in an LSU AgCenter research trial. Above: Young soybean plants grow in a greenhouse before being inoculated with a disease as part of an LSU AgCenter research trial.



Through his studies funded by the Louisiana Soybean and Grain Research and Promotion Board, Leandro Vieira wants to clearly determine the viability of chicken litter for producers statewide. Photo provided by Leandro Vieira II

Continued from Page 1

using chicken litter fertilizer in soybean and corn crops. He also collaborates on the project with Saulo Castro, a sugarcane and soybean agronomist with trials at the AgCenter Dean Lee Research Station.

“I am hoping that by adding all those nutrients plus organic matter, we can affect all the three properties of the soil — the chemistry by improving fertility, the physical part by increasing organic matter and the biological part by providing more nutrients and organic matter for those microorganisms to be able to mineralize even more nutrients in the soil,” Vieira said.

Vieira joined the AgCenter in 2024 as the soil fertility specialist for specialty and forage crops, and in April he transferred to Macon Ridge to serve as a soil fertility specialist for field crops.

While earning his doctorate at the University of Florida, Vieira studied the effects of biosolids on soil health, water quality, plant growth and crop yields. Biosolids are composed of sewage sludge that is composted and treated to be safely applied to fields and is mainly used in pastures, Vieira said.

Chicken litter shares similarities with his work on biosolids. In his studies, Vieira said he hopes to detail how chicken litter fertilizer can improve soybean and corn yields. If yields do not increase quickly, he expects the yield gains will eventually arrive because of added nutrients and other soil improvements.

“We are gaining organic matter that down the road will certainly help to keep our land more productive, especially on areas that have sandier soils, silt loam or

Louisiana Soybean & Grain Research & Promotion Board Report



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areas that have been laser leveled, in which they remove that top soil and remove basically almost all the organic matter that they had before,” he said.

Preliminary results from Vieira’s first year of research have been promising. When applying chicken litter in one test field and inorganic fertilizers with the same amounts of nutrients in another field, yields for the chicken litter-treated field increased by 5%.

“Visually, I was seeing a higher number of pods per plant, and we decided to count,” Vieira said. “We sampled every single plot, and we got a 9% increase in the number of pods.”

Vieira cautions producers that not all chicken litters share the same nutrient content. Several factors can affect the nutrient composition of the litter, such as the number of chickens in a house, their feed and the types of straw or bedding materials used on the floor. Ideally, producers should have litter tested before applying, but that may not be practical for all farmers, Vieira said.

Through his studies funded by the Louisiana Soybean and Grain Research and Promotion Board, Vieira wants to clearly determine the viability of chicken litter for producers statewide.

“I don’t want everybody to apply chicken litter,” he said, “but I want people to know whether the properties of their soil will accommodate that kind of fertilizer source.” **Kyle Peveto**

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