

Louisiana Rice Research Board

ANNUAL REPORT

2017

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Checkoff Funds Support Research for Louisiana Rice Farmers

High water, low prices led 2016 challenges

Louisiana rice farmers faced a number of challenges in 2016, but the two biggest were high water and low prices.

Steve Linscombe, director of the LSU AgCenter H. Rouse Caffey Rice Research Station, said the poor crop of 2016 already has farmers concerned about 2017.

“That, coupled with the current market situation, means it’s going to be a tough year for producers,” he said. “It’s one you want to put behind you.”

Flooding hit north Louisiana in March and south Louisiana in August.

Linscombe said the year started well in south Louisiana, but flooding in north Louisiana caused problems there at planting.

“We had a lot more rice planted in early March and late February in south Louisiana than we have in a while,” he said. “We had 23 to 30 percent of it planted in that window.”

But midspring, rainfall interrupted many farmers’ planting plans. Linscombe said his research plots had to be planted later than he prefers.

Before the August flood, the crop would have been decent, he said. “We had a good crop, but not record breaking. Most people would have had a yield similar to last year.”

“Without the rains, we would have had a below-average yield on the first crop,” he said.

Then came the rain, and with it went a considerable amount of rice.

High water submerged rice, causing much of it to sprout. Quality losses were common, and yields decreased considerably.

Yields in north Louisiana also suffered from heavy spring rains and hot summer temperatures, Linscombe said.

The second crop turned out to be about average, off considerably from the record-breaking ratoon crop of 2015. Some had yields exceeding 20 barrels (72 bushels or 3,240 pounds), but many harvested rice in the single digits, he said.

AgCenter extension rice specialist Dustin Harrell said unfavorable weather conditions probably reduced yields. He said almost a third of the south Louisiana crop was planted by March 10, but then the weather changed.

Frequent rains reduced pollination, he said.

“Cloudy conditions and high night temperatures at flowering were probably the biggest factors,” Harrell explained. “We had some nights where the low might have been 75 degrees, so it was above that for much of the night.”

Yields probably were decreased by 6 to 7 percent before the August flooding, and the overall yields were down 12 to 15 percent after the flooding, he said.

But Harrell said he expects rice acreage to remain about the same next year.

Pest pressure was mixed.

AgCenter entomologist Mike Stout said many farmers had fields infested early with the South American rice miner, but he said it didn’t cause yield losses.

The insect was first discovered in Louisiana rice in 2004 on a few fields, but it wasn’t found again until this year. It’s possible next year the pest won’t be a problem, Stout said.

Stem borers, including the Mexican rice borer, were found on the station, and now the Mexican rice borer has been found in every rice-growing parish in southwest Louisiana. “They were really high early and not so high late season,” Stout said.

As for disease, “it wasn’t as bad as it could have been,” said AgCenter plant pathologist Don Groth.

Groth said he feared it would be a bad year for sheath blight because the disease was moving on plants rapidly. He also started receiving some reports of blast. “Then it got hot, and the fungal diseases just dropped out,” he said.

Groth said he thought the heat would set up conditions for a bad outbreak of bacterial panicle blight, but that didn’t happen either.

Cercospora was light in the first crop. “We saw quite a bit in the second crop,” Groth said.

Andrew Granger, AgCenter county agent in Vermilion Parish, said farmers were taking advantage of dry fall weather to prepare their fields for the 2017 crop.

“They’re out there doing a lot of land work. For the most part, they’re working like they are going to be planting a crop,” Granger said.

He said it was obvious by midseason that the Vermilion Parish crop would be off from 2015, but yields were affected even more by the August flood.

Granger estimated the average yield in the upper 30- to lower 40-barrel range (108-144 bushels, or 39-65 hundredweight). But some rice that didn’t flood had yields in excess of 50 barrels (180 bushels or 81 hundredweight), he said.

The second-crop yields also were off. “It’s going to be down considerably from last year. Much of it wasn’t harvested, maybe 25 to 30 percent of it,” Granger said.

Second-crop yields were 10-12 barrels (36-43 bushels or 16-19 hundredweight), with low quality also, he said.

Vermilion Parish farmer Christian Richard said without the flooding, yields would have been comparable to the 2015 crop, about five barrels to seven barrels off his average (18-25 bushels or 8-11 hundredweight).

The season started with good planting weather, but it quickly turned rainy and cloudy. “The rice wasn’t growing. It wasn’t responding to anything,” Richard said.

He said he got 60 percent of his crop harvested before the August flooding, and he wasn’t able to resume harvesting until three weeks later. He had difficulty restarting the harvest because he had no dry ground where trucks could be loaded.

From the Louisiana Rice Research Board

The Road To Profitability

Even though it has been several weeks since the presidential election, we are still trying to wrap our heads around what it means to have such a change in leadership at the top. We are a divided nation when we look at our differences, but when we look at our similarities, we don't look that different.

When we look at rice research, we find we have much more in common among us than we have in conflict. The whole rice industry is interested in the same destination: the profitable production of rice. Every year we discover new roads to that destination, and we don't go down the old roads anymore. Ralph Waldo Emerson once said, "The mind, once stretched by a new idea, never returns to its original dimensions." The same is true of the rice industry.

Your Louisiana Rice Research Board concentrates by state statute on research to achieve maximum yield and quality at minimum cost per unit. In board discussions, we have asked ourselves to define "research," place that definition in our minutes, and have it available to ensure that we use wisely the funds entrusted to us.

Here is that definition: "The term 'research' means any type of test, study, project, program or analysis designed to advance the production, use, agronomic traits, marketability or quality of rice, including, but not limited to, any investment or expenditure designed to expand and enhance such research efforts and resources needed in conducting research relating to yield, nutritional value, cost of production, new product development, health research and marketing of rice."

In arriving at the destination of the profitable production of rice, we find that there are two fundamental issues that determine that outcome – supply and demand. Without adequate supply, we decimate our infrastructure, increase our cost per hundredweight and chase our customers to other sources. Without demand, we have nowhere to go with our product, rapidly lowering of farm gate prices and, again, decimating our infrastructure.

We can use research to discover ways to maximize supply and demand. You can be assured that your Rice Research Board is on the road to doing that with the resources you have invested.

Jackie Loewer, Chairman
Louisiana Rice Research Board

Testing for potential drought-tolerant lines



Niranjan Baisakh, LSU AgCenter geneticist, at left, selects panicles from test plots in a project designed to develop drought-resistant rice that could withstand periods of dry soil, increasing water usage efficiency. Assisting Baisakh is Christopher Addison, a graduate student who will be taking the lines to the International Rice Research Institute in the Philippines in 2017 where a retractable rain-out shelter will be used to shield research plots from rainfall.

Niranjan Baisakh, an LSU AgCenter plant molecular biologist and geneticist, is working on a project to develop rice that uses less water.

A considerable amount of water is used to grow rice. It requires about 170 gallons of water to produce one pound of rice, Baisakh said.

Currently grown rice varieties in Louisiana need plenty of water to maximize yields. Water shortages happen periodically, which can affect the productivity of a rice crop. And climate change is expected to worsen the availability of quality water for irrigation, he said.

A three-week window last year with nearly no rain allowed good conditions for testing drought-tolerant rice lines during the reproductive stage, but heavy rains interfered with the test in 2016, Baisakh said.

Next year, to grow rice in controlled drought conditions, a graduate student will take the lines to the International Rice Research Institute in the Philippines where a retractable rain-out shelter is used to shield research plots from rainfall.

Rice plants that are denied water respond in multiple ways, Baisakh said. Some die, while others look healthy with tissue tolerance but produce a low amount of grain. Still other plants with drought tolerance show leaf rolling to reduce water loss through evapotranspiration and slightly reduced growth so the plant's energy is directed to producing grain.

From Baisakh's tests, the lines that produce the most rice under drought are selected to remain in the breeding program.

From last year's field screening, Baisakh has selected 21 lines each from several progenies of two crosses between drought-sensitive Cocodrie and two drought-tolerant varieties, Vandana and N22. They are being grown at the Rice Research Station.

These high-yielding, drought-tolerant lines will be genetically compared against drought-sensitive lines to identify genetic markers within the chromosomal regions previously identified to be associated with drought tolerance. Baisakh is using sequencing technology to identify markers to screen for lines with drought tolerance and good yield potential.

He also is screening 420 varieties of a rice diversity panel collected from around the world. They have been planted in the field for validating the drought-tolerance markers and to identify superior lines for incorporating their drought tolerance potential to Louisiana-bred rice cultivars.

Because rice grown in upland conditions is more susceptible to blast disease, Baisakh said, blast resistance is a trait that should be included in the breeding process for drought tolerance.

Development of a suitable variety for the Gulf South will take a few years. "Our goal is to grow these varieties with minimal water," he said.



The Louisiana Rice Research Board decides how farmers' check-off funds will be spent on research aimed at helping rice farmers. Board members are, left to right, bottom row, Brian Wild, Chairman Jackie Loewer, Vice Chairman Clarence Berken, Secretary-Treasurer Richard Fontenot, Jason Waller, Damian Bollich, Jude Doise; top row, left to right, Phillip Lamartiniere, Benjamin Rayburn for Louisiana Agriculture Commissioner Mike Strain, Ronald Sonnier, Fred Zaunbrecher, Sammy Noel, Donald Berken, Michael Fruge and Dane Hebert.

Paul "Jackie" Loewer Jr.
Chairman (LA Rice Growers)
4362 White Oak Highway
Branch, LA 70516
jploewer@aol.com
(337) 788-0665 home/office
(337) 581-5179 cell
(337) 788-4076 fax

Clarence A. Berken
Vice Chairman (LA Rice Growers)
9201 Highway 380
Lake Arthur, LA 70549
caberken@centurytel.net
(337) 587-2474 home
(337) 523-4208 cell

Richard B. Fontenot
Secretary/Treasurer
(LA Farm Bureau)
3535 Vidrine Road
Ville Platte, LA 70586
richardbfontenot@gmail.com
(337) 363-0759 home
(337) 831-1245 cell

Donald J. Berken
(LA Farm Bureau)
616 South Joseph Street
Welsh, LA 70591
donaldberken@hotmail.com
(337) 734-2403 home
(337) 526-3777 cell

Richard Damian Bollich
(LA Rice Growers)
15787 Sunshine Road
Jones, LA 71250
damian@ne-tel.net
(318) 823-2762 home
(318) 282-4627 cell

Jude Doise
(LA Independent Rice Producers Assn.)
30010 Bornsdall Road
Elton, LA 70532
judedoise@yahoo.com
(337) 246-0004 cell

Michael Fruge
(LA Rice Growers)
1230 B&B Avenue
Eunice, LA 70535
mfruge@horizonseed.com
(337) 457-5376 home
(832) 260-6193 cell
(337) 457-9637 fax

Dane L. Hebert
(LA Farm Bureau)
5569 Alfred Road
Maurice, LA 70555
dnlabear@yahoo.com
(337) 893-9331 home
(337) 523-2598 cell

Phillip Lamartiniere
(LA Rice Growers)
386 Hwy. 1194
Marksville, LA 71351
ricefarm@bellsouth.net
(318) 253-5969 home
(318) 201-1132 cell

Samuel J. Noel
(LA Farm Bureau)
14414 Sammy Road
Abbeville, LA 70510
snoelrice@yahoo.com
(337) 643-1256 home
(337) 230-8500 cell
(337) 643-3512

Ronald J. Sonnier
(LA Farm Bureau)
1238 Green Oak Road
Kinder, LA 70648
ronnie.kay@centurytel.net
(337) 738-2780 home
(337) 375-1990 cell

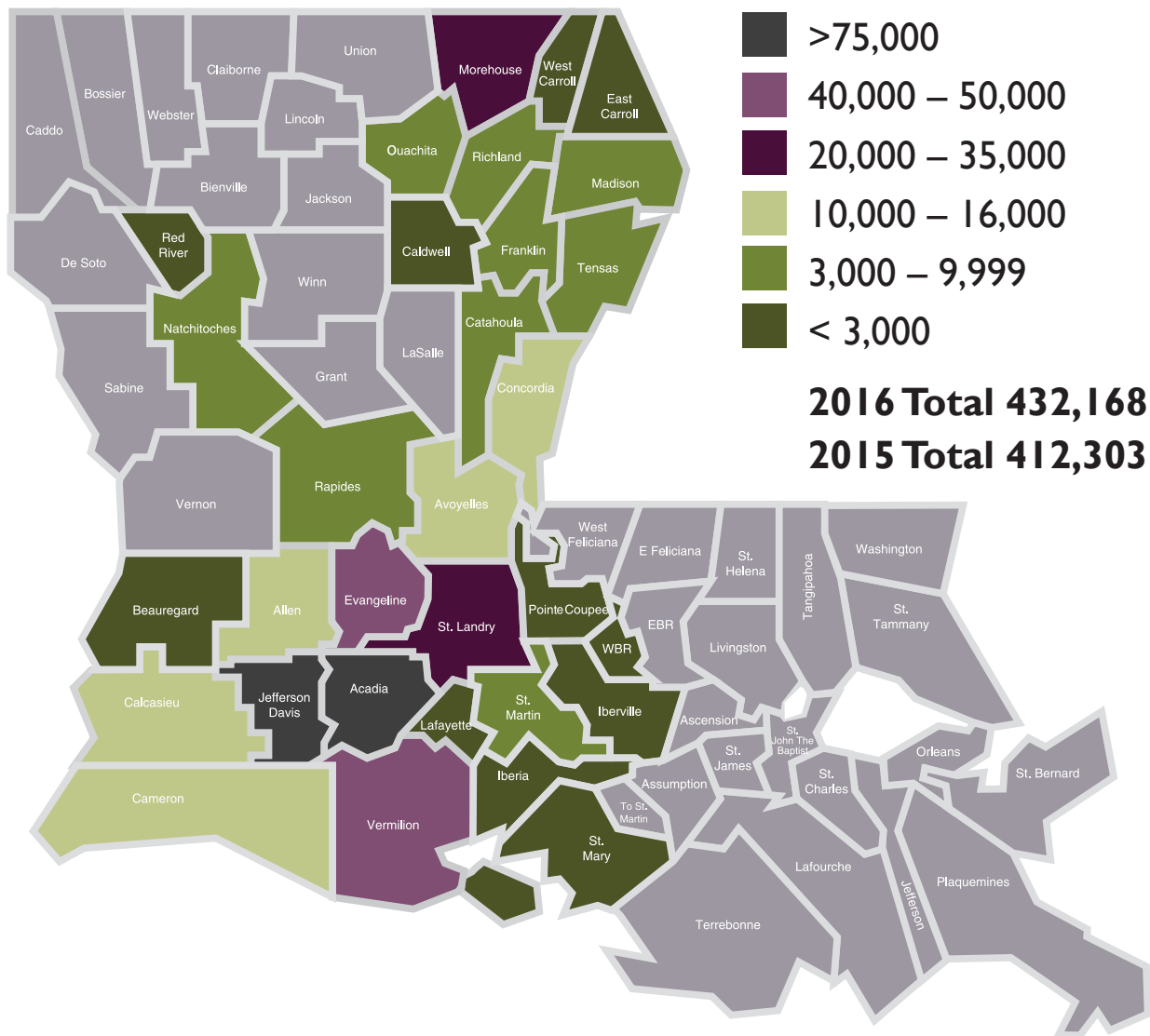
Jason A. Waller
(American Rice Growers)
P.O. Box 152 118
Tilbury Street
Mer Rouge, LA 71261
jasonwallerfarms@yahoo.com
(318) 282-9190 cell

Brian T. Wild
(American Rice Growers)
306 Rhorer Street
Welsh, LA 70591
BT.Wild@yahoo.com
(337) 247-4455 cell
(337) 587-2260 fax

Frederick C. Zaunbrecher
(LA Rice Growers)
6909 Cameron Street
Duson, LA 70529
fredzrice@yahoo.com
(337) 873-0322 home
(337) 278-9659 cell

Mike Strain
(Legislative Act)
5825 Florida Blvd
Baton Rouge, LA 70806
drstrain@ldaf.state.la.us
(225) 922-1234 work

2016 Louisiana Rice Acreage by Parish, All Types



Top 10 Rice Parishes

Parish	2015 Total Acreage	2016 Total Acreage
Acadia	81,847	83,598
Jefferson Davis	75,669	81,013
Vermilion	49,901	48,857
Evangeline	40,701	43,970
Morehouse	31,532	27,504
St. Landry	23,968	24,051
Allen	13,628	15,646
Avoyelles	12,096	13,666
Calcasieu	12,673	12,291
Concordia	7,244	12,134



An airplane applies fertilizer immediately after a field is harvested on the Fontenot Farm in Evangeline Parish, and a mower is used to cut the rice stubble to increase second-crop yield. AgCenter studies have shown the benefits of mowing or rolling stubble after harvest to improve yields, and now work is being done on the use of gibberellic acid to further increase second-crop yields.



AgCenter rice agronomist and rice extension specialist Dustin Harrell looks over research plots testing seeding rates for different varieties.

Nitrogen fertilizer study providing answers

LSU AgCenter agronomist Dustin Harrell has been studying nitrogen and seeding rates for potential Clearfield and Provisia varieties.

“The objective is to have an agronomic package to coincide with the release of new varieties so we can answer questions about how they are going to respond to nitrogen fertilizer and the proper seeding rate,” Harrell said.

The nitrogen fertilizer study is being done to learn how much a variety can be pushed with fertilizer before lodging and excessive disease occur.

The work is not limited to releases by the AgCenter. Harrell is looking at seeding and nitrogen rates for varieties released by Mississippi State University and the University of Arkansas as well as RiceTec.

Research trials in 2016 were conducted on more than 5,100 plots at seven locations statewide.

“We also continue to evaluate urea and fertilizer treatments designed to reduce volatility,” Harrell said. “There may be new products in the future.”

“Although current nitrogen fertilizer efficiency is good in rice production when best management practices are used, we can always do better,” he said.

The stubble management study on ratoon rice could not be completed in 2016 because of wet weather and flooding at harvest of the first crop.

But Harrell said his 2016 work on the use of gibberellic acid (GA) to increase ratoon yields was completed. In 2015, data showed an increase of 3 barrels (10.5 bushels) when the material was used at the rate of 4 ounces an acre with stubble management. Even in rice with no stubble management, 4 ounces of GA boosted yield by 2.2 barrels (7.8 bushels).

Ratoon test plots harvested in 2016 showed rice sprayed with GA had a yield increase, but it was not as significant as the 2015 test results.

Texas rice farmers have used the chemical with good results. “We want to have three years of data before it is a recommended practice by the LSU AgCenter,” Harrell said.

The GA application has to be made when the grain is in the soft dough stage of the first crop, otherwise the chemical stimulates growth at the wrong time and could cause a plant to grow taller and increase the chances of lodging, he said.

The application could be tank-mixed with an insecticide sprayed for stinkbugs on the first crop, he said.

Rice research benefits from international exchanges

International collaboration with rice researchers has benefitted the H. Rouse Caffey Rice Research Station as well as rice farmers, according to station director Steve Linscombe.

“The rice station cooperates with a number of institutions and companies around the world,” Linscombe said.

The station has obtained germplasm from two institutions in China for the hybrid breeding project.

Hybrid breeding requires a male-sterile line, and Linscombe was able to obtain one from the Guangxi Academy of Agricultural Sciences in China. “We developed a research agreement with that institute, and we were able to obtain hybrid breeding lines that our hybrid program is based on,” Linscombe said.

Linscombe and AgCenter rice agronomist Dustin Harrell returned to Guangxi in September. “We will be obtaining additional lines from them fairly soon,” Linscombe said.

In addition, a relationship with the Chinese Tianjin Academy of Agricultural Sciences will provide more hybrid breeding material.

A relationship developed with Alberto Livore in Argentina provided a setting to test the first Clearfield lines almost 16 years ago, Linscombe said. “We worked with him to do several yield tests during our winters.”

Livore’s testing was repeated in the early development of Provisia. “We sent Provisia lines down there in the winter of 2014-15 to two different locations. This provided us with additional data to make decisions on what became the PV024-A line,” Linscombe said.

The AgCenter provided seeds from the variety Cocodrie, developed at the Rice Research Station in 1998, that was used in the development of Golden Rice aimed at boosting vitamin A levels in poor, malnourished populations of developing countries, Linscombe said.

The AgCenter is exchanging germplasm with an Italian rice breeding company to develop a cold-tolerant rice, Linscombe said. Rice in northern Italy is grown in a temperate climate that has spells of cold weather, and development of rice that can withstand lower temperatures in Italy could help improve cold tolerance for rice grown in Louisiana during the early spring.

The AgCenter has exchanged breeding lines with Uruguay and Brazil. “We have used a lot of South American germplasm in our breeding program through the years,” Linscombe said.

One of the parents of CL152, developed at the Rice Research Station in 2011, was the Uruguayan variety Tacauri, which Linscombe obtained in 2000 in a germplasm exchange.

Deliberto named interim rice economist

Mike Deliberto worked in 2016 as the interim LSU AgCenter economist for rice, as Mike Salassi took over as head of the AgCenter Department of Agricultural Economics and Agribusiness.

Deliberto didn’t grow up on a farm, but while working on his bachelor’s degree in forestry management, he took an ag policy course that piqued his interest. From there, he obtained a master’s degree in agricultural economics in 2006 and started working for Salassi as a research associate focusing on rice.

“I really fell in love with agriculture,” Deliberto said.

At Salassi’s urging, Deliberto earned his doctorate degree, writing his dissertation on the 2014 farm bill. He also teaches agricultural economics to undergraduate students.

“I’m fortunate enough to really love what I do,” he said.

Deliberto is eager to help farmers with their economic decisions, Salassi said.

“Dr. Deliberto does outstanding work in the area of rice production economics and farm management,” Salassi said.

Tests show promise for new fungicide

A new fungicide will be available for treating sheath blight and blast. “We’ve been testing it for about five years,” said LSU AgCenter plant pathologist Don Groth.

Groth said his tests have shown Amistar Top from Syngenta works well against fungicide-resistant sheath blight, which means it will be an additional tool with Sercadis and Elegia fungicides. In addition, it has good activity against blast.

“We can get back to treating blast and sheath blight in a single application,” Groth said.

Instead of propiconazole for sheath blight, the product has difenoconazole, he said.

The application for a label from the U.S. Environmental Protection Agency was filed in last spring, but it’s uncertain if approval will be issued before the next growing season. “We might get it in time for next season, but we’re not sure,” Groth said.



AgCenter rice breeder Steve Linscombe, far left, shows a rice field to representatives of an Italian rice company. Linscombe is working with the Italians to obtain cold-tolerant cultivars that could be used to develop varieties that could withstand cold temperatures of early spring in Louisiana. Cooperation with other rice breeders around the world has allowed the AgCenter to obtain lines of rice that have been essential to the breeding program at the H. Rouse Caffey Rice Research Station.

Bird repellent testing continues in Puerto Rico

Testing continues on a potential product to protect matured rice from bird predation.

The material, AV-4044, is a modified version of AV-1011, the seed-treatment material made by Arkion Life Sciences to prevent rice seed from being eaten by birds. It was tested last year at the LSU AgCenter H. Rouse Caffey Rice Research Station by the U.S. Fish and Wildlife Service.

This year, testing is being done in Puerto Rico, and AgCenter rice breeder Steve Linscombe said the island is an ideal testing location. “The bird pressure around our nursery in Puerto Ricco is pretty severe,” he said.

Netting is usually required to prevent birds from eating rice grown on small research plots at the Puerto Rico facility.

The testing will compare yields from different concentrations of the material with untreated rice.

Linscombe also said the need continues for DRC-1339, a bait material used in spring to control blackbirds, which is undergoing re-registration.



Jong Ham evaluates panicles for disease severity at the LSU AgCenter H. Rouse Caffey Rice Research Station. Ham’s research team has tested various chemical and biological materials to develop new measures for cost-efficiently managing bacterial panicle blight. Another field project is evaluating rice lines from various sources to study the genetics of plant resistance to be used in breeding new disease-resistant rice.

Entomologist keeps eye on borers, stink bugs

The range of the Mexican rice borer continues to move eastward in the rice-growing region of southwest Louisiana.

“I’m fairly certain that they are found in every rice-growing parish in southwest Louisiana,” said Mike Stout, LSU AgCenter entomologist and head of the Department of Entomology.

The pest was found in 2016 for the first time at the H. Rouse Caffey Rice Research Station, he said. In June, 10 moths were found in two pheromone traps at the station, and that number doubled in July. By September, more than 60 were found in the traps.

But Stout said the numbers are unlikely to cause yield losses yet. “The data indicates that the longer they have been established in a parish, the higher the populations are,” he said.

Data are showing that some varieties are more resistant to the borers than others. “For now, we can say that Jupiter and other medium grains have consistently shown susceptibility in experiments,” Stout said.

Dermacor seed treatment currently offers the best protection, he said.

No scouting procedures have been established for spraying after the borers are in a field, although monitoring pheromone traps may prove to be the best way to scout for the insect. The larvae that damage rice plants are hidden inside the plant, and the eggs laid by adults are tiny, he said.

Stout said 2016 was an unusual year overall for insects. The South American rice miner, only seen sporadically in Louisiana rice in the past 12 years, was widespread.

“I think virtually every plot on the station had some South American rice miner,” Stout said. “But I mostly think the damage is cosmetic. It just causes a leaf here or there to drop off and die. I don’t think it caused any yield losses.”

It’s possible that the rice miner will not be as numerous next year. “There was something about this

year, I have no idea why. It was a weird year,” he said.

Stout also conducted a series of tests last year to see if stink bug nymphs are causing reductions in yield or grain quality.

Stink bug eggs were placed inside mesh sleeves that were wrapped around immature rice panicles. The sleeves were left in place while the stink bugs hatched and became adults. When the grain matured, the rice was harvested and inspected for blanks and pecky rice.

The study could help answer the question of whether stink bug nymphs should be included in the count when sweeping for insects, and whether the nymphs could cause significant damage that would prompt spraying for the insects earlier than for adults, Stout said.

“Do the stink bugs develop quickly enough to actually cause damage to the grains? And it looks like they do,” he said. “We’ll probably change our recommendation to include nymphs as well as adults.”

Pathogens enter the holes made by stink bugs to feed on the developing grains, resulting in discolored grain called pecky rice. As grain hardens in the dough stage, stink bugs no longer feed on the hardened rice, Stout said.

Another stink bug threshold study is looking at stink bug numbers and rice damage. The current threshold of five stink bugs per 10 sweeps is probably too low.



LSU AgCenter entomologist Mike Stout examines a mesh sleeve containing stink bug eggs in an experiment to determine the extent of damage to rice kernels caused by stink bug nymphs. From this project, Stout will determine if thresholds for spraying stink bugs should include nymphs.

“We’re probably spraying too much insecticide for stink bugs. It looks to me like we could probably raise our thresholds,” he said.

Stout continues to study the biggest problem insect for rice: the rice water weevil. “We are now analyzing results of five separate experiments conducted during 2014 through 2016 in which we compared the susceptibility of the 8 most commonly grown varieties of rice to the rice water weevil,” Stout said. “We are in the process of doing a statistical analysis of the data and will prepare recommendations and ratings on the resistance of rice varieties to the rice water weevil based on these data.”

None of the varieties showed high levels of resistance, but there are differences, he said.



AgCenter rice agronomist Manoch Kongchum inserts a sample of a Jazzman rice line to be analyzed by a gas chromatograph for the proper aroma trait. Kongchum tested 15 lines of Jazzman with the Clearfield trait, and one will be selected to be grown as foundation seed at the H. Rouse Caffey Rice Research Station in 2017.

New Provisa varieties getting closer

The availability of Provisa rice is getting closer for farmers.

“We’re hoping to have seed production in 2017, with an expected launch date of commercial production in 2018,” said LSU AgCenter rice breeder Steve Linscombe.

Provisa will provide a longer lifespan for Clearfield rice. “Having a second herbicide-resistant system should allow this technology to remain viable well into the future,” Linscombe said.

Work at the H. Rouse Caffey Rice Research Station on the project began four years ago as the result of an agreement with BASF that developed the herbicide-resistant line. The line was an Indica type that had cooking qualities not found in Southern long-grain rice with a high amylose content and a low gelatinization temperature, in addition to pubescent leaves and grain, Linscombe said.

Linscombe had to breed the rice to have smooth leaves and grain as well as desirable cooking characteristics. Lab equipment to test cereal chemistry at the station has been crucial to determining if the line had the intended traits that would make it acceptable for American palates.

The line, PV024-A, was developed through extensive use of the winter nursery in Puerto Rico. “We pushed Provisa in Puerto Rico every winter, and most of the time we grew two generations every winter,” he said.

Last year, the largest AgCenter seed increase in Puerto Rico was planted on 4.2 acres. Larry White, now retired director of the foundation seed program, planted the seed increase and then came out of retirement to harvest that crop.

This line has decent yield potential, but not as well as the highest inbred varieties. Yield is a trait that will be pursued in subsequent generations. “We’ve got that in the pipeline right now,” Linscombe said.

Advanced experimental lines are being grown in Puerto Rico this winter.

A new Clearfield Jazzman line will be grown in 2017 for foundation seed, with a seed increase underway this winter in the Puerto Rico nursery. The line has good aroma and grain quality, with yield better than previous versions of Jazzman rice, Linscombe said. And rice merchants who have sold Jazzman have a favorable opinion of it.

2016 Louisiana Rice Research Board-funded projects

CONTINUING PROJECTS

Ag Economics & Agribusiness

Economic Analysis of Rice Production and Farm Management in Louisiana
Deliberto, Michael (Salassi) \$44,000

Dean Lee Research Station

Development of UAV and Drone Technologies for Rice Production Field Use
Price, Randy \$45,650

Entomology

Integrated Management Strategies for Insect Pests of Rice in Louisiana
Stout, Michael \$105,435

LSU Department of Biological Sciences

Identifying Low-Arsenic Rice Varieties
Smith, Aaron \$21,197

Northeast Research Station

Yield Evaluation of Commercial-Advanced (CA) Testing Program in Northeast Louisiana
Miller, Donnie \$11,000

Plant Pathology & Crop Physiology

Characterization and Utilization of Genetic Traits for Resistance to Multiple Diseases of Rice
Ham, Jong Hyun \$52,338

Development of Seed Treatment Methods to Enhance Rice Health
Ham, Jong Hyun \$32,588

H. Rouse Caffey Rice Research Station

Integrating Molecular Breeding Approaches into Rice Variety Development Program
Famoso, Adam \$71,500

Development of Disease Control Practices in Rice
Groth, Donald \$75,350

Rice Management Strategies for Efficient Utilization of Agronomic Inputs and Natural Resources
Harrell, Dustin \$144,375

Louisiana Rice Research Verification Program
Harrell, Dustin \$23,100

H. Rouse Caffey Rice Research Station Overall Support
Linscombe, Steve \$27,500

Multiple Generation Rice Breeding Nursery
Linscombe, Steve \$82,500

Enhancement of Rice Research and Extension Communications
Linscombe, Steve and Gould, Frankie \$43,395

Development of Superior Rice Varieties for Louisiana
Linscombe, Steve \$566,600

Development of Hybrid Rice and Sheath Blight-Resistant Germplasm for Louisiana
Oard, James \$127,710

Marker-Assisted Breeding and Development of Molecular Markers for Important Traits in Louisiana Rice Production
Utomo, Herry \$31,763

Rice Grain Quality Enhancement: Characterization of Elite High Protein Lines and Development of Herbicide-Resistant Rice
Wenefrida, Ida \$25,988

Plant, Environmental and Soil Sciences

Development of Drought-Tolerant Rice for Louisiana with High Water Use Efficiency Under the Future Climate Change Scenario
Baisakh, Niranjana \$22,000

Breeding Rice Varieties with Tolerance to Abiotic Stresses
Subudhi, Prasanta \$69,443

Weed Management in Herbicide-Resistant/Tolerant and Conventional Rice
Webster, Eric \$159,519

NEW PROJECTS

Idlewild Research Station

Development of an Encapsulation Protocol for Sodium Nitrite for Control of Feral Swine in Rice
Gentry, Glen \$30,000

H. Rouse Caffey Rice Research Station

Effect of Water Management Practices on Nitrogen Use Efficiency and Yield of Drill-Seeded, Delayed Flood Rice Production
Kongchum, Manoch \$28,550

TOTALS

Total Continuing Project Funding: \$1,772,950

Total New Project Funding: \$58,550

Total 2016 Funding for Continuing and New Projects: \$1,831,500



continued from page 1

“We spent a lot of money on limestone and rocks to make a place to load. When you try to get the rice and you can’t, it’s a double whammy,” Richard said.

Richard said he will continue with his usual plan for rice, soybeans and crawfish. “The years 2012 and 2013 were pretty good, so you take the good with the bad,” he said.

Todd Fontenot, AgCenter county agent in Evangeline Parish, said farmers in his area estimated the average yield at 39 barrels (140 bushels or 63 hundredweight). The acreage of second crop is down because farmers cut their first crop too late or because of rutted fields. Others had decided against a second crop and chose to get fields ready for crawfish sooner, he said.

Even before the flood, it was obvious the crop wouldn’t be as good as previous years, Fontenot said. But fields that didn’t flood had good yields, including one on his own family farm that yielded almost 50 barrels, he said.

Fontenot doesn’t anticipate much change in acreage next year. “I don’t think there’s going to be many changes. I don’t think we’re going to see a major change one way or the other,” he said.

Vince Deshotel, AgCenter county agent in St. Landry Parish, said some fields were total losses from the flood, while fields that didn’t flood had good yields. Quality suffered in rice harvested after the flood.

Deshotel said it was expected late in the season that yields would be down this year by eight barrels to 12 barrels (29-43 bushels or 13-19 hundredweight) before the flood because of excessive heat and rain during pollination.

Some farmers may shift to other commodities in 2017. “Those producers who can grow other crops will if the prices don’t increase,” Deshotel said.

Jeremy Hebert, AgCenter county agent in Acadia Parish, said the year got off to a good start with early planting. “We had a decent start with perfect conditions.”

But then rainfall interfered with the late planting, and rice suffered from hot weather. “It got hot early, and it stayed hot,” Hebert said

Harvest in Acadia began in mid-July, and more than 75 percent of the rice was cut by the time the flooding occurred, Hebert said. Some fields that flooded in August were never cut.

The Acadia Parish Extension Office flooded, and Hebert and his staff had to relocate in Crowley.

The flooding persuaded some farmers not to try a second crop, Hebert said. Yields from the second crop ranged from eight barrels (29 bushels or 13 hundredweight) to almost 30 barrels (108 bushels or 49 hundredweight), he said. But the average was probably a bit more than 20 barrels (72 bushels or 32 hundredweight).

Acadia Parish acreage will probably stay about the same. “Next year, they’re not going to change much,” Hebert said. “They are getting some ground work done.”

Acadia Parish farmer Mike Hundley said 2016 was “a year you want to forget, for sure.”

Before the flood, he said, 20 percent of his crop was harvested but yields were down from his average crop by five to seven barrels (18-25 bushels or 8-11 hundredweight).

Some fields were flooded long enough for some rice to sprout, and Hundley suspects fertilizer applied for the second crop was lost to flooding.

Cutting the last 20 percent took weeks, he said, and trailers had to be loaded on the highway because of wet ground.

Second crop yields were in the teens to 20 barrels, “a far cry from a few years ago,” Hundley said. “But everything is a far cry from a few years ago.”

Frances Guidry, AgCenter county agent in Jefferson Davis Parish, said farmers weren’t expecting a lot from this year’s crop before the flood.

“It wasn’t the greatest, and then the flood didn’t help. Everybody was saying it was a mediocre year,” she said.

The areas around Thornwell and Lake Arthur had the worst flooding, and many were unable to grow a second crop. Rice acreage in the parish could decrease unless prices rise, Guidry said.

Cameron Parish farmer Paul Johnson said he will not look back on the year



Research plots of Clearfield rice lines are harvested in a preliminary yield test at the H. Rouse Caffey Rice Research Station. Weather conditions complicated harvest for researchers and many farmers after heavy rainfall in August. Photo by Brady Williams/LSU AgCenter

favorably. “It’s been a really tough year, to put it mildly,” he said.

He agreed that cloudy, wet weather interfered with pollination. “I think that led to yields that were down quite a bit,” he said. And his second crop suffered because he was unable to put out fertilizer because of floodwaters.

“Our water continued to rise for two to three weeks,” Johnson said.

After the flood, Johnson still had 30 percent of his crop in the field, and yields dropped by 12-15 barrels (43-54 bushels or 19-24 hundredweight) with lower quality.

But Johnson is looking to next year, and he has started preparing land for the 2017 crop. “We’re ready to close the books on 2016, and do a little hunting,” he said.

North Louisiana rice farmers had their flooding problems at planting time.

Keith Collins, AgCenter county agent in Richland Parish, said most planting was completed by mid-May, a month later than usual. “A lot of our rice was later than usual,” he said.

That put the crop’s development during the hottest time of the summer, he said, and pollination occurred during cloudy, wet weather.

“It had a detrimental effect on the yields. Overall, folks were a bit disappointed,” Collins said. “Everybody said it looked good, but when they put the combine in the field, the yields just weren’t there.”

He estimated the yields at 150-160 bushels an acre (42-44 barrels or 68-72 hundredweight), off by 5 to 10 bushels (one to three barrels or eight to 16 hundredweight) from last year.

Collins said the current farm bill is favorable to rice, and for that reason he doesn’t expect an acreage decrease. But acreage could increase if prices increase, he said.

Holly Ridge farmer Scott Franklin said flooding in March hindered a lot of farmers. “We actually were lucky and got to plant fairly early,” he said.

The rice crop was damaged by heat. “The rice crop looked beautiful until boot stage and heading, and that’s when I could tell we had some blanks,” Franklin said.

Franklin, who farms 1,200 acres and owns an elevator and commercial dryer, said the market for rice is slim. “My main concern right now is where in the world am I going to sell it and at how bad of a price?” he said.

Franklin expects to see some rice acreage move to cotton. “I do think we are going to have farmers running on a thin margin who aren’t going to get financing,” he said.

Hybrid rice work shows promise

Work by the LSU AgCenter to develop superior hybrid rice continued in 2016 with promising results.

AgCenter hybrid breeder Jim Oard said a Clearfield hybrid and a conventional hybrid were entered into the commercial advanced yield trial and the uniform regional nursery.

“They consistently had high head rice yields and good disease tolerance,” Oard said.

Milling and chalk evaluations for the line CLH161 were acceptable in 2016, he said. It will be quality tested further after a seed increase in Puerto Rico this winter and another increase at the Rice Research Station in 2017.

Four small-plot yield trials conducted last year identified four new Clearfield hybrids, two conventional hybrids and two hybrid lines with the Provisia gene. The Clearfield hybrid lines out-yielded current commercial hybrids currently in the marketplace, and they had less chalk, Oard said.

“We are paying very close attention to chalk,” he said.

A disease study of three conventional and one Clearfield breeding lines compared their sheath blight resistance to CL111 and Cocodrie. Yields were good, and disease tolerance was high, Oard said.

“This is our best result we’ve ever had. We are going to continue to breed and cross these,” he said.

Testing will be done in 2017 to see how the lines perform in a disease-free environment, and the lines will also be crossed this winter with elite, high-yielding lines.

“We’re not there 100 percent yet, but we are making good progress,” Oard said.

The new DNA marker technology used by AgCenter rice breeder Adam Famoso has been a big asset for Oard’s program. “It is helping us tremendously in developing these new hybrids, especially with grain quality markers,” Oard said.



Research associate Lazo Pavich makes a cross in a greenhouse for the hybrid program at the LSU AgCenter H. Rouse Caffey Rice Research Station. Several lines of hybrids are showing good results, including some that have the Clearfield trait.

Weed research looks at Provisa technology

Much of AgCenter weed scientist Eric Webster's work in 2016 involved studies of the quizalofop herbicide to be used with Provisa rice technology.

"We had several trials that were tank mixes," Webster said.

He tested combinations of quizalofop with broadleaf and aquatic herbicides.

The work has shown that 2,4-D, propanil, Grandstand, Regiment and Grasp are not good candidates for mixing with quizalofop. "A lot of times, the broadleaf herbicides antagonize the grass herbicides," he said.

But Permit, Basagran and Londax are not as antagonistic with quizalofop.

Webster said he saw an increase in fields last year with outcrosses and bad red rice problems that would have benefitted from Provisa.

"It's going to allow us to control those weedy rices," he said. "It's something that's really going to help us."

Webster's work is showing that rotating Provisa rice with Roundup Ready soybeans will get a problem field under control.

"It takes at least a three-year rotation to get out of that weedy rice," he said.

During 2016, Webster received several calls about Brooks paspalum and Nealley's sprangletop. In addition, water primrose was more of a problem, and more farmers had problems with aquatic weeds such as ducksalad because of the increase in water-seeded rice.

New DNA analysis speeds up variety development

The H. Rouse Caffey Rice Research Station has acquired new technology to help rice breeders identify lines of rice with desirable traits.

LSU AgCenter rice breeder Adam Famoso said the system can process up to 40,000 samples in a day and have the DNA analyses completed for making selections at a fraction of the cost of other methods.

Plants from segregating populations can be started in the greenhouse, and tissue samples are taken when the plants are only an inch tall. The DNA is analyzed to indicate which plants should be kept to be grown for seed.

"In half a day, we can do thousands of DNA extractions," Famoso said.

The process uses a series of robotic devices that prepare the samples to be read with cameras that use fluorescent lights to analyze the genetic makeup, which is displayed on a computer screen.

Growing the lines in the field would take up more space and can only be done during warm months. But working in the greenhouse allows plants to be grown year-round to produce seed that can be grown at the Rice Research Station or at the winter nursery in Puerto Rico.

Trying to develop a disease-resistant line can be difficult in years when diseases are not widespread because plants will not show signs of infection, Famoso said. But the DNA testing will reveal whether a plant has the genetic disposition towards resistance or susceptibility.

Famoso said the breeding process will not rely on just the new equipment to indicate if a line has good traits. "It's not going to replace what we do in the field," he said. "The final decisions are always going to be made on how plants behave in the field."

The process also can be used for the foundation seed program. Before headrows are planted, seed can be analyzed for purity, and any seed showing unwanted traits can be discarded before planting. "It will allow us to identify off-types before we ever plant them in the field," Famoso said.



Research associates Carl Dischler, left, and graduate student Jacob Matson, far right, transplant rice seedlings that have been culled by rice breeder Adam Famoso, center, from lines raised in a greenhouse and tested for disease resistance using robotic technology that reveals genetic characteristics from just a leaf sample of a seedling.

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Editor: Richard Bogren
Writer: Bruce Schultz
Designer: Ana Iverson
Photographer: Bruce Schultz

For more information on Louisiana rice production and Rice Research Board activities, visit this website:
www.LSUAgCenter.com/rice

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William B. Richardson, LSU Vice President for Agriculture
Louisiana State University Agricultural Center
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Louisiana Cooperative Extension Service
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AgCenter rice breeder Adam Famoso, left, collects rice in a bag from lines of rice harvested at the Rice Research Station. Famoso is using DNA technology to screen lines of rice for disease resistance, decreasing the number of test plots that have to be grown in the field.