



Louisiana Rice Research Board

ANNUAL REPORT

Checkoff Funds Support Research for Louisiana Rice Farmers

2015 rice harvest goes well, but not a record-breaker

Louisiana rice farmers had excellent weather to get the 2015 crop out of the fields, but the harvest was a decline from the two exceptional harvests of the past two years, according to LSU AgCenter experts.

“This is not going to be one of the harvests for the record books,” said Steve Linscombe, director of the H. Rouse Caffey Rice Research Station. He estimated the 2015 harvest is down 10-15 percent from last year.

He said the north Louisiana rice crop endured unusually hot, dry weather that could affect grain quality.

“This has been one of the most difficult years for rice producers that they’ve seen in a long time,” said Dustin Harrell, LSU AgCenter rice specialist, who estimated the yield decrease at 10 percent.

Harrell and Linscombe said heavy rainfall from March until May, and frequent overcast skies, were major reasons for lower yields. More clouds mean less sunshine for photosynthesis, and that resulted in fewer and smaller grains per panicle, Linscombe said.

Harrell said the excess rainfall complicated the season because fertilizer applications were delayed. In addition, early in the season, small rice plants were submerged for a considerably long time, he said.

Linscombe said disease was a factor in the harvest. Blast disease, while not as severe as 2012, was an issue in some fields and caused significant yield reduction, he said. “We did have some fields that had a significant issue with *Cercospora*.”

Bacterial panicle blight also showed up, he said, but sheath blight was not as bad as usual probably because fungicides worked well against that disease.

“Quality seems to be OK, especially on our earlier planted rice,” Linscombe said. But later planted rice that matured during the hotter temperatures showed higher levels of chalk and lower head rice and total milled yields in some cases, he said.

He said second-crop yields were up considerably from 2014, and a few growers were reporting yields as high as half to 60 percent of their first crop results.

Don Groth, LSU AgCenter plant pathologist, said early season blast appeared in the 2015 crop. But it didn’t develop into the devastating form, rotten neck blast in most fields, probably because farmers sprayed their affected crops early enough with fungicide.

“They had the warning early enough, unlike in 2012,” he said. However a few fields had yield reductions associated with rotten neck blast.

Groth said bacterial panicle blight was found in some fields of Jazzman, but he expected the disease to be more widespread because of the hot weather as the crop matured. The heat inhibited widespread development of sheath blight and blast, he said.

Even though planting was delayed by weather, harvest went smoothly with few rain interruptions. Dry weather prevented farm equipment from rutting up the fields, Linscombe said, and that means a good start for farmers growing a second crop of rice.

Linscombe said he is noticing more farmers manipulating rice stubble, either by rolling or mowing the remaining stalks, to increase ratoon crop yields, as shown in studies conducted by Harrell.

Keith Fontenot, who retired as LSU AgCenter county agent in Evangeline Parish, said rice farmers there reported mixed results, with yields from 40 to 55 barrels (131-180 bushels or 59-81 hundredweight). He said one farmer only managed 26 barrels (85 bushels or 38 cwt.) in a field suddenly hit with rotten neck blast.

Fontenot said he’s seeing many farmers preparing fields for a second crop. “I’m amazed at the amount of work I see happening. Everybody looks like they’re going to have a second crop.”

And the second crop turned out to be a bright spot for many farmers. Paul Zaunbrecher, who farms with his two brothers in Acadia Parish, said the first field of ratoon rice they cut averaged 25 barrels (82 bushels or 37 cwt.) and he had heard of some farmers cutting in excess of 30 barrels. “It could be the best year ever for second crop.”

Zaunbrecher said the second crop results seemed to verify the notion that a rice crop that doesn’t perform well in the first crop will compensate in the ratoon.

He said the challenge in the first part of the growing season reduced their yield to the low 40s, (130 bushels or 59 cwt.) compared to 52 barrels (170 bushels or 77 cwt.) last year.

Paul Johnson, who farms near Hayes in Cameron Parish, said the 2015 second crop started with promising results, yielding 20 barrels (66 bushels or 30 cwt.) from Jazzman II.

“We were cutting 28 barrels (92 bushels or 41 cwt.) in the first crop. Everybody I talk to says second crop yields are up,” Johnson said.

He said his first crop yields were down by 15 percent from 2014. “The rice looked good, but it just didn’t yield.”

Johnson is pleased with the quality. “It’s as good if not better than the first crop.”

Barrett Courville, who retired as LSU AgCenter county agent in Acadia and Jefferson Davis parishes, said yields are off by about 4 barrels an acre (13 bushels or 6 cwt.) from last year. He said farmers were growing second crops on at least half of the rice acreage in Acadia and Jefferson Davis parishes.

Alan Lawson, Crowley rice farmer and president of the Acadia Parish Rice Growers Association, said his yields early in the harvest started around 40 barrels an acre (131 bushels or 59 cwt.) but improved as he went to more fields, up to the low-50 barrels (164 bushels or 74 cwt.).



Rice on a seed increase of LA2134 is harvested at the H. Rouse Caffey Rice Research Station. The line has been approved as a variety, CL153.

“Yields are not as good as they have been in past few years, but they’re better than some I’ve heard in surrounding parishes.”

Andrew Granger, LSU AgCenter county agent in Vermilion Parish, said yields were down from last year, also.

“We’re four to five barrels short (13-16 bushels or 6-7 cwt.),” he said. “We’re not going to average 44 barrels (144 bushels or 65 cwt.) like we did last year.”

In north Louisiana, Keith Collins, county agent in Richland Parish, said this year’s crop was respectable but not as good as last year.

“It’s off a tad, but not much,” Collins said. “Some farmers have as good a crop as last year, and some are off by 5 to 10 percent.”

He said he doesn’t expect farmers to increase rice acreage next year in north Louisiana. “Right now, they’re in survival mode, and I don’t see an increase until we have higher prices.”

Farmer Jim Lingo of Oak Grove said his crop varied from fair to good, depending on when the weather would allow him to plant. Earlier planted rice had the best yields, he said. But his yields were better than last year’s because he was able to plant earlier.

Next year, Lingo said, rice acreage in north Louisiana will drop. “The rice acres are going to be down unless we have a price swing.”

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Rick Zaunbrecher, director of the Rice Research Station foundation seed program, far right, works with student worker Zachry Istre to bundle rice cut from a breeding row.

From the
Louisiana Rice Research Board

In her poem “Driving West,” Linda Pastan wrote, “We are the pioneers of our own histories.” What we do today determines what kind of rice industry exists tomorrow, just as how those who came before determined how our industry thrives today.

An example of that was the recent name change of the Rice Research Station in Crowley to the H. Rouse Caffey Rice Research Station. This is a fitting tribute to Dr. Caffey who was station director from 1962 to 1970 and chancellor of the LSU AgCenter from 1984 to 1997. Dr. Caffey was a model of all the station directors before and after him who built the station into the world-class status that it enjoys today.

How well we take care of our land today determines its productivity in the future. How well we take care of our tractors today determines how long they will last. How well we take care of our children will determine how well they take care of theirs. And so it goes.

The mandate of your Rice Research Board is to be caretakers of your research checkoff funds. Your board continues to fund the research projects explained in this report. Our industry burns research like a tractor burns diesel. It is the power and energy that drives our industry. We will always need it. The need is never met. There is always more out there to know, just like a tractor that always needs fuel.

In addition to the checkoff funds, the Research Board is trustee for Louisiana’s share of Col-Rice funds generated by the free trade agreement with Colombia. To date the board has used those funds to purchase necessary equipment and an irrigation well for the Rice Station and to create a \$1 million endowed chair to help fund rice research within the AgCenter, all long-term investments that secure the future of rice research.

Our state rice industry is blessed in that 96 percent of all the checkoff funds collected by the Department of Agriculture and Forestry are distributed to your board. Some choose not to participate, and they request a refund. The next time you contemplate asking for a refund, ask yourself if you want to be a part of ensuring the rice industry’s future or simply choosing to ride the coat tails of those who do.

Let the future say of us that we were their pioneers, that we did the hard work and hard thinking, that we made the hard decisions to ensure that rice will continue to feed our people, and that we used our resources well.

Jackie Loewer, Chairman
Louisiana Rice Research Board

Rice Research Board Members



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

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

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

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

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

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

Heavy spring rains create
production challenges

In his first year as the LSU AgCenter rice specialist, Dustin Harrell dealt with the same weather-related problems encountered by farmers in north and south Louisiana.

Heavy rains in the spring created problems for many farmers at planting time. Continuing rainfall complicated fertilizer and herbicide applications.

Part of Harrell’s work includes working closely with farmers enrolled in the LSU AgCenter Verification Program. In 2015, Harrell had five fields in the program: two in north Louisiana (Concordia and West Carroll parishes) and three in south Louisiana (Acadia, Vermilion and Cameron parishes).

Harrell walked the fields weekly with county agents, farmers and consultants.

“It was a great learning experience for everybody involved,” Harrell said.

Before the first seed was planted, Harrell met with farmers and county agents to decide on a variety and seeding rates, and to conduct soil sampling to determine nutrient needs.

Because of the wet weather, many growers, including two in the verification program, chose to dry broadcast seed, by flying the seed onto a field and then running a harrow over the soil.

“If you have a short window for planting, you can fly on the seed a lot faster than you can drill it,” Harrell said. “It seems to be gaining popularity.”

Harrell said the heavy rainfall flooded fields of young rice throughout Louisiana, but the verification fields withstood the excessive rain. “We thought we might have stand problems, but we didn’t have to replant any of the fields.”

Dry yields varied in the verification program, with 40 barrels an acre, or 145 bushels, on the Vermilion Parish field, 55 barrels, or 197 bushels, in Acadia Parish, and 44 barrels, or 158 bushels in Cameron. In north Louisiana, yields were 189 bushels, or 52 barrels in Concordia Parish and 202 bushels, or 56 barrels, in West Carroll.



Dustin Harrell, LSU AgCenter rice specialist, center, examines a rice plant with Adlar Stelly, right, and Andrew Granger, LSU AgCenter county agent in Vermilion Parish. Photo by Bruce Schultz



Harrell plants rice at the Rice Research Station. Photo by Bruce Schultz

Station renamed for H. Rouse
Caffey

Louisiana’s rice research facility has been renamed the LSU AgCenter H. Rouse Caffey Rice Research Station to honor the late agricultural leader.

The LSU Board of Supervisors approved the name change in October, and a dedication ceremony was held Nov. 4.

Farmer Jackie Loewer, also chairman of the Louisiana Rice Research Board, said without the station, the rice industry would not exist in Louisiana today. “Without Rouse Caffey, it wouldn’t be the station it is today.”

Caffey was station director from 1962 until 1970, and he was the LSU AgCenter Chancellor from 1984 until he retired in 1997. He died in 2012.

Research looks at arsenic accumulation in rice

Aaron Smith, an LSU molecular biologist, is working to find out which genes determine how a rice plant absorbs arsenic from the soil.

In recent years, attention has been focused on arsenic levels in several foods, including rice.

“We’re already confident that there is a genetic component to arsenic accumulation in rice,” said Smith, who began working on the arsenic project with LSU AgCenter rice breeder Steve Linscombe in 2014.

Some varieties appear to have more capacity to take up arsenic than others.

“What we are trying to learn is which genes are responsible for those differences,” Smith said.

Previous work has identified some of the pathways used in plant roots to absorb arsenic, so Smith wants to find out how much arsenic accumulates higher up in the plant and ultimately into the grain.

Plants absorb arsenic the same way they take up nutrients such as phosphorus and silicon, he said.

“We’d like to find a rice variety that has undetectable or very low levels of arsenic in the grain,” Smith said.

He wants to learn what biochemical processes and pathways lead to arsenic getting into the seeds.

Perhaps in some varieties, the roots absorb arsenic without moving the element higher into the plant. But he said completely blocking arsenic uptake is challenging because that also would prevent a plant from absorbing important nutrients such as silicon and phosphorus.

Smith said exposure to arsenic can result in a phenomenon known as straighthead that results in panicles with incomplete grain filling. Arsenic can trigger straighthead, but the condition is also caused by other factors, he said

Linscombe has a nursery to test for tolerance of rice to straighthead, and Smith plans to take plant tissues from that source and analyze the material for arsenic content.

Smith also is growing rice plants indoors in a hydroponic lab where the seedlings are fed small amounts of arsenic, in the parts-per-billion range, along with required nutrients. The plants’ roots will be analyzed for arsenic content.

To find the genes responsible for arsenic uptake, the genetic makeup of plants with relatively high

amounts of arsenic will be compared to plants with low amounts of arsenic. He said the SuperMike-II supercomputer at LSU will be used to analyze those genetic sequences.

Smith also has a National Science Foundation grant to study how phosphorus is taken up by rice plants, and what he learns from that project could be used in the arsenic work.

Once genetic markers are found for arsenic uptake, they can be used to screen lines for the development of a rice variety with reduced arsenic levels.



Aaron Smith demonstrates the technique for growing rice indoors to study how the plants absorb arsenic. Photo by Bruce Schultz

USDA studies new product for blackbird control

A study conducted in 2015 by the U.S. Department of Agriculture at the H. Rouse Caffey Rice Research Station could lead to the release of a product that would address the problem of blackbirds feeding on maturing rice.

Scott Werner, research wildlife biologist from the USDA National Wildlife Research Center at Fort Collins, Colorado, chose to conduct the study at the station.

“The National Wildlife Research Center has worked with the Rice Research Station through the years and the blackbird problem has been prominent here, so it’s a natural fit for this kind of study,” Werner said.

This field efficacy study was supported by the manufacturer of AV1011 and AV4044 blackbird repellents, Arkion Life Sciences, of New Castle, Delaware, Werner said.

The study used 30 cages where plots of rice were planted. Just as the rice reached the milk stage of maturity, five red-winged blackbirds were released into each enclosure. A maintenance diet of bird seed was left in all of the cages for the birds to eat, and the food was weighed daily to determine how much of the feed was eaten.

Of the 30 plots, the rice in 10 was untreated. Another 10 plots were sprayed with a low rate of AV4044 per acre, and the last 10 plots were sprayed with a higher rate of AV4044 per acre.

The product AV4044 contains anthraquinone, the same material used in the AV1011 seed treatment used to prevent bird predation after planting. The

chemical has no long-lasting effects on birds, but the birds find it unappealing to eat.

Werner said AV4044 also has a component that is activated by ultraviolet rays in sunlight that cannot be detected by the human eye, but birds can see it. They learn to associate the visual cue with rice that has been treated with the unappetizing chemical.

Werner said he has conducted lab experiments with this product to confirm its effectiveness by comparing blackbird consumption of repellent-treated and untreated food.

“With regard to rice yield, we observed greatest rice yield among plots treated with the higher rate, and least rice yield among untreated plots,” Werner said.

The second measure of efficacy was provided by weighing blackbird consumption of a maintenance diet of bird seed provided for the birds in each enclosure.

“As predicted, blackbirds in plots treated with the AV4044 repellent consumed more of the maintenance diet than birds within untreated plots throughout the 22-day field study,” Werner said. “These repellent efficacy data suggest that AV4044 shows promise for the protection of ripening rice from blackbird damage throughout the three weeks prior to harvest.”

The blackbird problem is not confined to the southern U.S., Werner said, with the pest also feeding on crops in Asia, South Africa, and Central and South America.



Shelagh DeLiberto of the U.S. Department of Agriculture Wildlife Services releases a blackbird into an enclosure to study the effectiveness of a bird repellent on maturing rice.



Alan Werner, of the USDA Wildlife Services, applies anthraquinone to a plot of rice to study what concentration of the chemical works best to keep birds from feeding on maturing rice.

Harrell studies fertilizer use during wet soil conditions

LSU AgCenter rice specialist Dustin Harrell’s agronomy research has shown that fertilizer should be applied on dry ground to minimize nitrogen losses, but this year the ground often was too wet to follow that recommendation.

Because of the rainy spring encountered in 2015, Harrell plans to focus on the wet soil scenario in 2016 to study what should be done when fertilizer has to be applied when fields are saturated or flooded. The study will include split applications, timing and varied nitrogen amounts.

The objective will be to determine alternate recommendations for pre-flood nitrogen fertilization when the weather does not allow for fertilizer applications on dry ground. The alternate recommendations would incorporate recommendations that would possibly compensate for nitrogen losses that would be incurred by using multiple smaller applications.

Harrell also said farmers who participated in the verification program who faced flooded or wet soil spoon-fed nitrogen instead of applying the full amount at once. “We know we have to avoid large amounts if it’s going into the water.”

The agronomy work also includes investigating how much fertilizer should be used on newly released and potential new varieties as they are developed by rice breeders. Varieties are evaluated for their response to nitrogen at multiple locations across the state on an annual basis.

Harrell said farmers need to know how potential new varieties perform at different application rates of nitrogen fertilizer across different soil types and in different environments prior to their release so agronomic recommendations can be made.

Lodging is another important attribute closely looked at in these types of studies.

Harrell continues to evaluate the volatility potential of new and experimental fertilizer sources. Harrell obtained new equipment last year that will allow him to test fertilizers on multiple soil types in the lab year-round. Harrell said the data generated will help him estimate how much nitrogen is lost when fertilizers are applied on the various soil types that are found around the state.



Farmers provide land for rice breeding research

Different farmers in the rice-growing areas of Louisiana provide land for LSU AgCenter scientists to test new rice breeding lines and agronomic practices in real world scenarios.

“The off-station work is extremely valuable to the breeding program and several other programs,” said Steve Linscombe, H. Rouse Caffey Rice Research Station director.

Yield trials in Acadia, Vermilion, Jefferson Davis, Evangeline, St. Landry, Evangeline, Franklin and Richland parishes provide a better idea how experimental lines will perform, Linscombe said.

A commercial advanced yield test is also grown at the locations with tests of 60 lines, varieties and hybrids, he said. This year the tests included lines and varieties from Mississippi, Arkansas and Louisiana, and RiceTec.

The off-station locations also provide a good setting for holding field days, and to allow farmers to see how new varieties and lines will perform. Farmers provide land and water for the research.

“Many of these farmers have worked with us for years, and we are grateful for the sacrifices they make to allow us to conduct this work,” Linscombe said.

Dustin Harrell, LSU AgCenter rice specialist and agronomist, said the off-station trials provide his projects with diverse settings.

“Off-station locations are invaluable because we get to look at different

environmental conditions, different soils, and different weather patterns,” he said.

A fertilizer recommendation on silt loam soil may not apply to heavy clay soils, for example.

Part of Harrell’s work involves testing different fertilizer rates on new varieties. “We like to have at least three years of trial data before we come out with a recommendation.”

Harrell also does ratoon research off-station to study ways of improving second-crop yield. His work has shown that mowing or rolling stubble forces regrowth from the lower part of the plant, resulting in bigger panicles with more grain. Also, the plants grow at a uniform rate that makes it easier to decide when to harvest.

“You get a 5-barrel increase on average,” he said.

Because the soil at the Rice Research Station has been well maintained with nutrients, going to a setting with lower quality nutrient levels is essential for some of Harrell’s work.

“When it comes to fertility research, I can’t do potassium, phosphorous and zinc research at the station,” he said. “I have to go to off-station locations to look at those issues.”



Brent Theunissen, LSU AgCenter research associate, harvests rice from test plots at the Bieber Farm near Mamou. Researchers rely heavily on off-station sites to provide better insight to how varieties and agronomic practices perform in different settings. Photo by Bruce Schultz

New herbicides show promise for rice production

Eric Webster, LSU AgCenter weed scientist, tested nine experimental herbicides in 2015.

Because the materials are proprietary, he can't discuss details, but he said many of them have considerable potential.

"We are working on two new modes of action that we don't have now in rice."

He said one product could be a significant tool against a wide variety of grasses and broadleaf weeds. "It offers as much broad spectrum coverage as any material I've ever seen."

Work continued on the Gowan product, benzobicyclon, for aquatic weed management.

He said much of his work concentrates on aquatic weeds fostered by maintaining fields flooded for crawfish production in the off-season.

Webster continued looking at ways to control Nealley's sprangletop, and he said it continues to become more of a problem in Louisiana. "Still the best way to control it is with RiceStar HT at 24 ounces per acre applied post-emergence."

Webster said the low rice prices in 2015 resulted in farmers reluctant to pay the additional costs for Clearfield rice seed, resulting in many fields with outbreaks of red rice and weedy rice as the result of hybrid dormancy or outcrossing. The upcoming Provisia technology will help control red rice and weedy rice that isn't controlled by Newpath herbicide now, he said.

Webster said he has had a demonstration project using a rotation of soybeans-fallow-rice to clean up fields with infestations of outcrossings and other weedy rice.

Webster said chemical companies ask the LSU AgCenter to test their products because Louisiana is unique.

"Our weed spectrum is so different because of crawfish production and the warmer climate," he said.

Water-seeding also is peculiar to Louisiana, and it provides an additional factor for testing a new product, he said.

In order for the LSU AgCenter to recommend a product, it has to be tested by academic researchers.

"We're the ones who are going to have the answers for the initial questions."



Steel rings are placed in a field at the H. Rouse Caffey Rice Research Station South Farm to study an experimental herbicide. The rings were used to prevent dilution of the chemical. Photo by Bruce Schultz

Louisiana farmers benefit from global cooperation in rice breeding

Cooperation with other rice researchers, domestic and abroad, benefits ongoing work at the H. Rouse Caffey Rice Research Station and ultimately helps farmers, according to Steve Linscombe, director.

The LSU AgCenter is one of the five southern rice-growing states participating in the Uniform Regional Nursery. The universities each provide experimental lines to be grown throughout the region, up to a total maximum of 200.

"This allows breeders to see how the lines perform at four other locations," Linscombe said.

The different environments provide a picture of how the lines will perform in different soils, climates and a diversity of disease pressure.

"It gives me the opportunity to look at the advanced experimental lines in other programs," he said. "Often we will see experimental lines from other states that can be used to make crosses."

The LSU AgCenter worked with other universities in recent years on a federally-funded

cooperative project that studied sheath blight resistance and higher quality milling.

The LSU AgCenter is a member of the hybrid rice consortium in an agreement with other public rice research institutes in Arkansas, Missouri, Mississippi, Texas and Texas, said Jim Oard, LSU AgCenter hybrid breeder.

"We believe it is in the best interest of the university to cooperate," Oard said.

Researchers share germplasm, which benefits the breeding program by having additional rice lines to use in breeding programs, he said.

Last year, the LSU AgCenter worked with the University of Arkansas in a cooperative hybrid yield trial, Oard said. "We found out that our hybrid didn't lodge in Arkansas."

Harrell, LSU AgCenter rice specialist and agronomist, has worked with other universities on research projects involving arsenic and greenhouse gases.

At the Rice Technical Working Group meeting held every other year, researchers from industry and academia, including the LSU AgCenter, meet and share their research findings on a number of projects. The next RTWG will be held in Galveston, Texas, in March.

The LSU AgCenter has been involved in many cooperative endeavors internationally, including researchers in Uruguay, Argentina, Brazil, Colombia, Costa Rica, Italy, Belgium, Spain, the Philippines, Japan and China.

The germplasm used to start the LSU AgCenter hybrid program originated from Chinese lines. Seaman Knapp, regarded as the pioneer of the cooperative extension model as well as a pioneer in Louisiana rice production, obtained lines of rice from Japan that were used to start a breeding program at LSU.

"I can say without any reservation, international cooperation has been to our advantage," Linscombe said.

Scientists fine-tune hybrid experimental lines

The hybrid breeding program is in the process of fine-tuning experimental lines that have shown promise, according to Jim Oard, LSU AgCenter hybrid breeder.

He said the yields of three of the LSU AgCenter hybrids were among the top of 60 entries in the 2015 Commercial Advanced Trials.

Yields results of varieties in the test varied from location-to-location, he said, but the hybrids' yields were consistently high.

But Oard said the hybrids need refining to address lodging, chalk and grain dimension uniformity issues.

He said this year's stormy weather provided a good test for lodging susceptibility.

"There are some experimental lines that show some promise that we'll take a look at next year," Oard said. "We have spent quite a bit of time in the past two years to develop foundation hybrid stocks to address these issues."

DNA marker technology has been used extensively in the hybrid program, he said. "That's been critical to be able to speed up the process."

Release of an LSU AgCenter rice hybrid could be two to three years away, he said.



Prasanta Subudhi works on developing rice varieties more tolerant to the salt that is creeping into Louisiana soils.

Continuing projects

New projects

Northeast Research Station

Multiple Generation Rice Breeding Nursery	
<i>Linscombe, Steve</i>	\$75,000

Enhancement of Rice Research and Extension Communications	
<i>Gould, Frankie and Steve Linscombe</i>	\$39,450

Development of Hybrid Rice and Sheath Blight-Resistant Germplasm for Louisiana <i>Oard, James</i>	\$116,100
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Marker-Assisted Breeding and Development of Molecular Markers for Important Traits in Louisiana Rice Production	
<i>Utomo, Herry</i>	\$28,875

Rice Grain Quality Enhancement: Characterization of Elite High Protein Lines and Development of Herbicide-Resistant Rice	\$23,625
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**School of Plant, Environmental and Soil
Sciences**

Development of Drought-Tolerant Rice for LA with High Water Use Efficiency Under the Future Climate Change Scenario	\$20,000
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Breeding Rice Varieties with Tolerance to Abiotic Stresses	
<i>Subudi, Prasanta</i>	\$63,130

Weed Management in Herbicide-Resistant/Tolerant and Conventional Rice <i>Webster, Eric</i>	\$145,017
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Yield Evaluation of Commercial-Advanced (CA) Testing Program in NELA <i>Miller, Donnie</i>	\$10,000
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Development of Seed Treatment Methods to Enhance Rice Health	
<i>Ham, Jong Hyun</i>	\$29,625

Accelerating Breeding Selections through Integration of Molecular Breeding Approaches <i>Famoso, Adam</i>	\$65,000
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Totals

Total Continuing Project Funding: \$1,507,147

Total New Project Funding: \$104,625

Total 2016 Funding for Continuing and New Projects: \$1,611,772

COL - Rice Committee Recommendation
2015 LSU Col-Rice Project Research Support
\$950,000

Lab and Office Space Research infrastructure
\$750,000

Meet new rice breeder, Adam Famoso

Adam Famoso started working at the H. Rouse Caffey Rice Research Station in May as a breeder.

Famoso grew up in Hamilton, New Jersey, between New York and Philadelphia. He received an associate degree from Paul Smith's College in upstate New York in urban forestry.

He obtained a bachelor's degree in horticulture from Penn State University, and then obtained his doctorate from Cornell University in plant breeding and genetics.

After graduate school, Famoso began his career with the seed company DuPont Pioneer. Based in the U.S., he focused on hybrid rice breeding in

Asia, primarily in the Philippines and India. His work included developing breeding strategies and implementing the use of genetic markers in the breeding program.

In his first growing season at the Rice Research Station, Famoso is getting familiar with rice farming in Louisiana and operations at the research station.

"I'm trying to learn how things are done and understand why things are done a certain way," he said.

Famoso will set up a lab for high-volume genotyping of new lines with the latest automated equipment to analyze DNA.

"Just a few years ago, something like this would not have been possible," he said

Steve Linscombe, station director, said Famoso's background in molecular genetics will make a significant contribution to the breeding program.

"We think he's going to be a valuable long-term asset to the efforts here at the Rice Research Station," Linscombe said.



Adam Famoso, the new breeder at the Rice Research Station. Photo by Bruce Schultz

Two varieties being considered for 2016 release

Two potential varieties are being considered for release this year by the LSU AgCenter, a Clearfield long-grain line, LA2134, and a Clearfield medium-grain, LA2008.

"We think both of these could be valuable additional options for producers," said Steve Linscombe, LSU AgCenter rice breeder.

The long-grain has performed well in yield tests and quality analyses, he said. "It did very well around the state, and it produced well in the foundation seed program here at the station."

It has good blast resistance, and results from quality testing were favorable, he said.

The medium-grain has shown good yield potential, with quality milling results and good appearance, Linscombe said.



The long-grain Clearfield line, LA2134, is being considered as a potential variety. Photo by Bruce Schultz

Genetic markers help identify desirable rice traits

Herry Utomo, LSU AgCenter molecular geneticist, has been working with genetic markers to identify desirable traits in the development of new rice varieties.

"We are working with the known markers we have for blast and quality traits as well as the aroma trait," Utomo said.

He said work is ongoing to identify genes responsible for additional traits, such as grain chalk, translucence and dimension.

In addition, he is working to identify gene sequences that could increase protein levels in rice. He said lysine, one of the amino acids related to protein production in rice, is typically found in low levels in most rice genotypes.

"If we can enhance lysine, then we can enhance the protein level in general," Utomo said.

He said a new approach is being made to genetically improve rice quality.

For new marker discoveries, the genetics of high quality rice is being genotyped and compared to lesser quality from mutations or selections. "It's another way of applying a critical gene for the good qualities we need."

With a new genotyping facility soon to be available at the H. Rouse Caffey Rice Research Station, these lines of work can further be accelerated.

Gretchen Zaunbrecher, research associate in Utomo's lab, used the genetic marker for aroma to identify one line out of 465 headrows that had the desired trait of aroma for Clearfield Jazzman.

Screening for disease gets earlier start in rice breeding

Don Groth, LSU AgCenter plant pathologist, assists the breeding program by screening potential varieties for disease resistance and susceptibility.

“We screen thousands of lines every year for the breeding project,” Groth said.

He said an emphasis has been made to screen earlier generations for sheath blight, bacterial panicle blight and blast.

Screening had been conducted with the fifth generation after a cross, but “we realized we needed to go further back,” Groth said. So now, the screening process can start as early the third generation after a cross.

Groth said disease resistance has gotten stronger in the breeding program at the Rice Research Station.

Susceptibility ratings for sheath blight were on the very susceptible and susceptible end of the rating system, he said, but that has been reduced. “We’ve got a lot more resistance and moderately resistance lines in the germplasm.”

That improvement is showing up in commercial fields where sheath blight is not as much of a problem as it was in previous years.

“My hope is we can eliminate the very susceptible and susceptible lines in the program,” Groth said. “That’s my aim – to give farmers varieties that don’t need fungicides as often.”

He said it’s not likely that a variety could be developed that would be completely disease resistant because yield and quality would be reduced.

“If a plant is completely resistant, it’s got to take some of its photosynthesis material and use it for that resistance,” he explained. “It’s a fine line, but we’re finding combinations that have high yield and disease resistance.”

He said sheath blight wasn’t as big a problem for some farmers who opted not to spray fungicides, saving \$30-40 an acre.

Groth said he is concerned that chemical companies are not investing as much in new materials to fight disease. He said only one fungicide class, strobilurins, is used for blast, but he would prefer to have more than one mode of action against the disease.

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Visit our website: www.LSUAgCenter.com

Editor: Linda Foster Benedict

Writer: Bruce Schultz

Designer: Ana Iverson

Photographer: Bruce Schultz

William B. Richardson, LSU Vice President for Agriculture
Louisiana State University Agricultural Center
Louisiana Agricultural Experiment Station
Louisiana Cooperative Extension Service
LSU College of Agriculture

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

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The LSU AgCenter and LSU provide equal opportunities in programs and employment.

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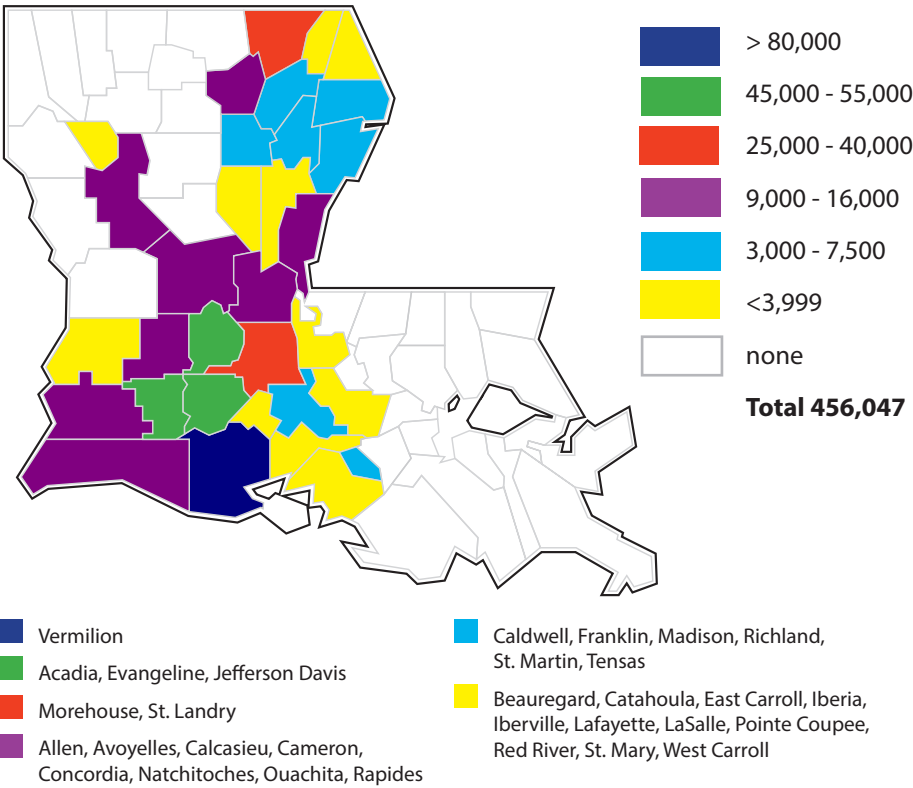
Louisiana Rice Research Board and the LSU AgCenter
P.O. Box 25100
Baton Rouge, LA 70894

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2014 Rice Economic Impact

- 456,047 acres
- Average yield 7,539 lb/A
- 3.4 billion pounds of rice produced
- Gross farm value \$515.7 million
- Total value of rice production in Louisiana \$670.4 million
- 1,040 producers

2014 Louisiana Acreage by Parish



New equipment aids in detecting rice aromas



Manoch Kongchum, LSU AgCenter agronomy researcher, uses a gas chromatograph to detect both quantitatively and qualitatively the aroma found in Jasmine-type rice. The equipment was purchased with Louisiana Rice Research Board funds, and it also is being used to analyze air samples in a study of greenhouse gas emissions from rice fields.

Breeding program relies on Puerto Rico nursery

The LSU AgCenter rice breeding program relies heavily on the Puerto Rico nursery to grow new lines of rice that could become varieties. By growing lines of rice in Puerto Rico during the winter and early spring, considerable time can be reduced in the variety development workflow.

Steve Linscombe, LSU AgCenter rice breeder, said farm manager Anthony Rivera is instrumental in the Puerto Rico facility’s success at the University of Puerto Rico Agricultural Experiment Station near LaJas.

“Anthony has been an asset to our breeding program to make sure all the agricultural practices are done properly and in a timely fashion,” Linscombe said.

Rivera said he cleared and laser-leveled an additional seven acres available for the LSU breeding program this year, increasing the total rice ground to the station to 87 acres.

“It’s a new area apart from the rest of the rice nursery, northeast of the station,” Rivera said.

In October, that tract was planted with seed from the Provisia project. The planting was accomplished with a grain drill that Linscombe shipped to Puerto Rico from the Rice Research Station.

Even though the island, a U.S. possession, has year-round weather, growing rice there is not easy. Insects are a threat throughout the year, and disease is prevalent. Hurricanes can be a threat, but the nursery is on the west side of the island, making it less vulnerable to storms that usually approach from the east.