

Louisiana Rice Research Board ANNUAL REPORT

2021

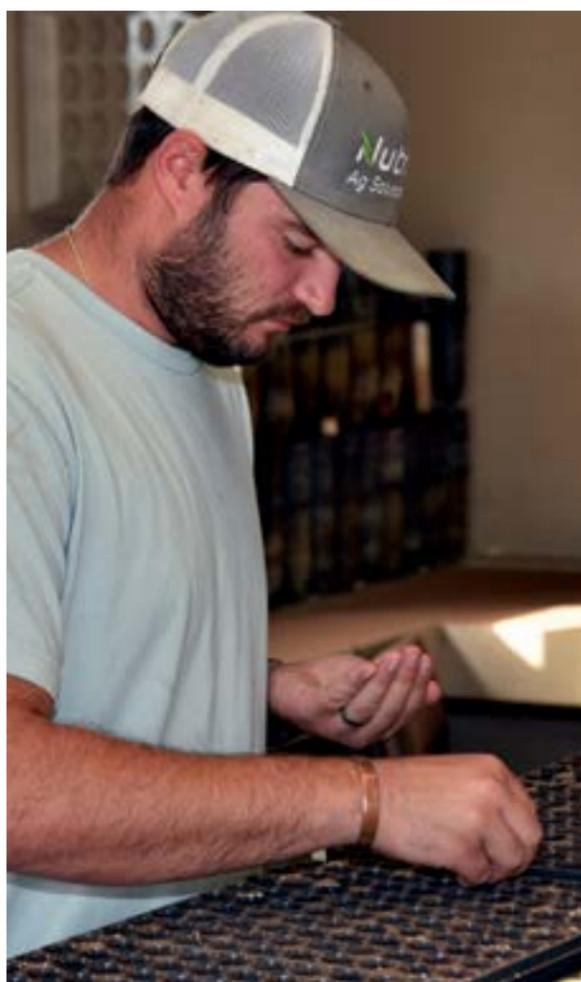
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Checkoff Funds Support Research for Louisiana Rice Farmers

New Provisia line may be available to farmers in 2021



Gavin Guidry, LSU AgCenter research associate, plants seeds to be grown in a greenhouse. Tissue from the young plants will be genetically screened for desired traits without growing them in the field.

The latest version of Provisia, PVL03, is being grown in a seed increase in south Texas.

The goal is that it will be available in a limited amount to farmers in southwest Louisiana in 2021.

“That’s where most of the testing was done for this line,” said Adam Famoso, LSU AgCenter rice breeder.

He said an additional 7 acres of PVL03 will be grown in Puerto Rico for next year also. PVL03 offers improved grain over PVL02, with a milled grain length of about 7 mm that is more desirable than the shorter PVL02 but not as long as PVL01.

“It has milled well in our tests,” he said.

PVL03 is less resistant to lodging than PVL02 because it is shorter, Famoso said.

Also, the disease resistance of PVL03 is notably improved over previous Provisia varieties, with PVL03 containing the broad-spectrum blast resistance Pita gene.

In three years of testing, PVL03 has consistently demonstrated yields at least equal to PVL02 and often better, he said.

The newest Clearfield variety, CLL17, showed excellent yield potential, demonstrated by an average of 59 barrels on a 24-acre foundation seed field at the station. Famoso said it has good blast resistance with fair grain quality. He explained that its grain is slightly shorter than CL153 and contains slightly higher chalk than CL153.

Famoso said a conventional line, LA2140, that was a candidate for a variety release is being held back after it failed to demonstrate an overall improvement over Cheniere.

“In 2020, yields of LA2140 were pretty much equal to Cheniere, and we observed significant disease in the foundation seed field,” he said.

Also, milling yields and grain appearance were not as good as Cheniere, he said.

“We have three other conventional lines that look much better,” he said.

Famoso said seed from the three lines has been sent to Puerto Rico to produce breeder seed of each line. One line, LA2207, out-yielded Cheniere, and it has good blast resistance and showed good disease resistance in fields with high disease pressure. Chalk was more prevalent than in Cheniere, he said.

Another line, LA2212, performed well in Louisiana and Arkansas, he said.

“We’ll make a final decision next year,” Famoso said.

Hurricane Laura’s winds flattened several of Famoso’s plots at the H. Rouse Caffey Rice Research Station and at a test site in the Calcasieu Parish community of Iow. The plots at Iow were ruined, and many of the panicles at the station had to be harvested by hand.

“We were able to handpick panicles, and now that material is in Puerto Rico,” he said.

Famoso said the importance of the Puerto Rico winter nursery becomes obvious after a devastating hurricane.

“It gives us that flexibility when something like this happens,” he said. “Fortunately, our seed increase of 6 acres did not go down.”

The breeding program benefited from the predictive system established by Christopher Hernandez, Famoso said.

“We have these predictions on all our lines, and we’re starting to use it on highly complex traits such as yield and milling quality,” he said. “The predictions are just as accurate, if not more, than a single-year preliminary yield test, so we were still able to advance lines this year that were lost in the hurricane.”

With lessons learned, we look to a promising 2021

Trying to explain to someone the difficulties of the 2020 rice growing season is probably similar to explaining to someone outside of Louisiana how boudin is made: it's complicated.

Start with the pandemic and all its complications, follow that with a good growing season, and then end with two devastating hurricanes.

Friends have lost part of their crops in the fields by flooding and winds, or in the bins with the loss of electricity and winds that blew the storage facilities open and exposed the crop to the weather.

North Louisiana farmers were not spared. Hurricane Laura maintained its ferocity all the way to the Arkansas line and knocked down rice in many fields north of Monroe. Then a little more than a month after, along came Hurricane Delta with flooding rain to that area.

As Hurricane Laura approached the Louisiana coast, many of us scrambled to get our crops out of the field. Neighbors helping neighbors was common across the rice-growing region.

Crisis brought the industry together along with the power of unity and cooperation.

The Fontenot family farm got help from neighbors providing tractor-trailer rigs, combines, tractors and grain carts. And when our crop was cut, we called neighbors to offer help. That's just the way farmers operate.

The same thing happened after the storm with damaged bins and power outages that crippled

our effort at drying the crop. Again, neighbors and others in the industry, such as Supreme Rice Mill, came to the rescue with labor, generators and spare bin space.

That kind of team effort has really enhanced the true core of the rice family. We all went through this together and got the job done.

The second crop was showing promise, but then along came Hurricane Delta, and its winds stripped much of the grain from the panicles.

In spite of all the turmoil, our Rice Research Board and the LSU AgCenter are looking forward. We have some exciting forthcoming developments that could dramatically ramp up our research capabilities.

Also, the amount of research money generated by the Colombian Free Trade Agreement in 2020 was more than expected, and that will help fund additional research at a time when the research financial picture is not so bright.

The bottom line is that those in the business of growing and marketing rice will be rewarded for their perseverance and tenacity with new rice varieties and improved ways of growing a crop.

Looking past the devastation brought by events in 2020 — and I know that's not easy in many cases — we accomplished a lot, and we're looking at doing more in 2021 and beyond.

**Richard Fontenot, Chairman
Louisiana Rice Research Board**



The Louisiana Rice Research Board decides how farmers' checkoff funds will be spent on projects aimed at helping the Louisiana rice industry. From left to right, bottom row, are Chairman Richard Fontenot, Vice Chair Dane Hebert, Secretary-Treasurer John Denison, Lester Cannon for the Louisiana Department of Agriculture and Forestry, and David LaCour; top row, left to right, Kim Frey, Jerry Leonards, Jude Doise, Eric Savant, Damian Bollich, Alan Lawson and Jeffery Sylvester. Not pictured are Sammy Noel, Jason Waller and John Earles.

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Don Groth, left, stands with Dustin Harrell. Groth is retiring as resident coordinator of the H. Rouse Caffey Rice Research Station at the end of January, turning over the reins to Harrell.

Harrell named coordinator

Dustin Harrell will be the next resident coordinator of the H. Rouse Caffey Rice Research Station on Feb. 1, replacing Don Groth, who is retiring at the end of January.

"Don Groth has had an exceptionally productive career with the LSU AgCenter," said Mike Salassi, the AgCenter program leader for plant and animal sciences. "Over his career, his rice pathology research program has been highly productive, making a significant contribution to the economic viability of rice production in southwest Louisiana, in particular, and the state as a whole."

Harrell will continue his agronomy research, but his work as rice extension specialist has been taken over by Ron Levy, who was the Louisiana Master Farmer Program coordinator and previously was the soybean extension specialist.

Groth started working at the Rice Research Station in 1983 as a plant pathologist.

He came to Louisiana from Iowa State University, where he earned his master's and doctorate degrees. He is a native of Illinois and he obtained a bachelor's degree in botany from Eastern Illinois University.

Harrell has worked as the station research coordinator, extension rice specialist and research agronomist since 2006.

He earned his bachelor's degree in agriculture science at Texas A&M University in 1997 and taught agriculture classes in Troup, Texas, near Tyler.

He earned his master's degree in soil science at Stephen F. Austin State University in 2001, and he obtained his doctorate degree at LSU in 2005 in agronomy as the first Ph.D. candidate under Dr. Jim Wang.

Then he worked for a year as a soil scientist for the Natural Resources Conservation Service near Corpus Christi, conducting soil surveys that included soil mapping at the King Ranch.

In 2006, Harrell became the agronomist at the Rice Research Station.

His first challenge was one that had stumped many experts. Named the "mystery malady" by some experts, the symptoms were yellowing and dying plants. Harrell identified zinc deficiency as the culprit.

Harrell also has conducted considerable research into products that are sold to prevent nitrogen fertilizers from breaking down before plants can absorb them. He also has studied ways to optimize second-crop yields.

Harrell, 44, and his wife, Kristy, have two girls and a boy.

"We are excited about Dustin Harrell becoming resident coordinator of the H. Rouse Caffey Rice Research Station," Salassi said. "Dr. Harrell brings the research experience and leadership skills necessary to lead the outstanding faculty and staff at the Rice Station."

Kurt Guidry, director of the LSU AgCenter Southwest Region, said Harrell will work well at running the station.

"I look forward to working with Dr. Harrell in this new role," Guidry said, "and I feel certain that he will take those same qualities of dedication and work ethic that have made him a successful research and extension faculty member to his role as resident coordinator."



Combines harvest a first crop in Evangeline Parish. While many farmers reported a good harvest, hurricanes and tropical storms reduced the yields for many farmers throughout the state.

Rice crop improves in storm-ravaged year

Overall, the 2020 rice crop was better than 2019, but for many farmers it was a difficult year.

For the second year in a row, the crop was dominated by weather. In 2019, Tropical Storm Barry hit when much of the rice was in pollination, and it was followed by steady rainfall that caused widespread disease problems.

In 2020, four tropical systems ripped through Louisiana. Each storm caused problems for rice in the field. Hurricane Laura even caused problems after rice was cut and in storage.

Dustin Harrell, LSU AgCenter extension rice specialist, said Louisiana farmers planted 476,497 acres in 2020, compared to 418,661 in 2019, representing a 13.8% increase.

Harrell said Acadia Parish remained the No. 1 rice-growing parish at 85,000 acres, compared to Jefferson Davis at approximately 82,000.

Morehouse Parish moved to No. 4 with 50,000 acres, edging out Evangeline Parish with 48,000.

Morehouse Parish had the largest medium-grain rice crop with 13,000 acres. Statewide, Louisiana farmers grew 49,000 acres of medium-grain rice, one-tenth of the overall crop.

All but two rice-growing parishes — Franklin and Beauregard — showed acreage increases. Rice acres in Madison Parish almost tripled, going from 4,424 in 2019 to 12,134 in 2020, while Natchitoches Parish increased by sixfold, going from 768 acres in 2019 to 4,713.

Harrell echoed others by saying the year was going well into the harvest.

“The growing season in southwest Louisiana was one of the top three years,” he said. “We were on par to having the second highest yields ever.”

Harrell estimates only 5% of the crop remained in the field when Hurricane Laura hit on Aug. 27. In south Louisiana, much of the stored grain was threatened when Laura knocked out the extensive electrical infrastructure, requiring portable generators to run aeration systems to dry the freshly cut rice. The tops of many bins and storage facilities were blown away, exposing rice to rain.



Freshly harvested rice is exposed to the elements after Hurricane Laura's winds blew the tops off grain bins at a farm in Calcasieu Parish. The winds also blew over a train of rail cars, which can be seen in the distance. Numerous bins were damaged from the storm. Power was lost throughout southwest Louisiana, and farmers had to use generators to run drying systems.

“All in all, if you factor in how good the year was, minus how it was on the very end, it was still better than last year,” Harrell said.

Harrell estimated yields averaged 7,100 pounds per acre, (157 bushels or 44 barrels), compared to 6,300 pounds last year (140 bushels or 39 barrels).

North Louisiana

For many farmers in north Louisiana, their crop suffered, but many farmers did well, depending on the weather in their areas.

“We took a whooping this year,” said Bruce Garner, county agent in Morehouse and West Carroll parishes.

Garner said rice farmers in his region were hurt by hurricanes Laura and Delta. He said some farmers

were barely able to get yields of 90 bushels (25 barrels) with the hybrid XL745.

“It was actually kind of heartbreaking,” he said.

Garner said the price of other commodities drove many farmers to plant more rice this year, and the Morehouse Parish acreage may remain static. He said the Kennedy Rice Mill at Mer Rouge is encouraging farmers to plant rice, and that could be a major factor in their planting decisions.

Jason Waller of Mer Rouge said he had a tough year from the start with wet field conditions that hampered planting. The crop progressed well, he said, but then came Tropical Storm Cristobal and hurricanes Laura, Beta, Delta and Zeta.

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Dustin Harrell prepares a sample to be tested in a laboratory with an experimental urease inhibitor to reduce ammonia volatilization. The research uses different soils from across the state, with different temperatures and varying durations. The work is aimed at showing growers potential benefits of a urease inhibitor before flooding.

Nitrogen rates for various rice lines studied

A major part of the work by Dustin Harrell, LSU AgCenter agronomist and extension rice specialist, is to evaluate nitrogen fertilizer rates and timing for new lines that could potentially become varieties.

“We also want to know the potential for lodging at these nitrogen rates,” Harrell said.

In addition, plant populations are evaluated to determine the optimal seeding rate for new lines.

“That way we can recommend an appropriate seeding rate,” he explained. “Some lines do well at low plant populations, and they tiller well, but too high of a rate can result in lodging and more disease.”

Harrell said his work also focused on furrow-irrigated rice, or row rice, to determine nitrogen rates and timing. The practice is used mostly in north Louisiana, where farmers grew about 30,000 acres of rice with this method.

He also is studying the use of nitrification inhibitors and urease inhibitors to improve nitrogen efficiency.

“One of the things we saw that worked best this year was two split applications pre-flood, 14 days apart, at the Rice Research Station,” Harrell

said. “In general, we have seen optimum nitrogen rates tend to be a little bit higher in the furrow-irrigated system.”

He said the system seems to require 100 pounds of additional nitrogen compared to the conventional practice of growing rice in a continuous flood.

Harrell also said nitrification inhibitors make nitrogen fertilizer more efficient for row rice, but it has little benefit in conventionally grown rice.

His rice research was conducted at the H. Rouse Caffey Rice Research Station and the St. Joseph Research Station, as well as the Charlie Fontenot farm near Palmetto, the Woodland Plantation near Monroe and the Kyle Hensgens farm near Iowa.

But Harrell said no data was obtained at the Iowa location when all trials were lost because of Hurricane Laura.

Hurricane Delta also rendered Harrell’s ratoon research unusable because the storm shattered much of the grain from the second crop grown in those plots at the Rice Research Station.

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“We’ve had 31 inches of rain since Laura,” Waller said.

Rice cut before Laura was yielding 230-240 bushels (63-66 barrels) but that dropped off to 160-170 bushels (44-47 barrels), he said.

He expects less rice and cotton to be planted in Louisiana, but more soybeans.

Waller said his fields are still wet, and he is anticipating planting next year could be difficult again unless the winter is drier than usual.

He said Laura arrived just as some rice was pollinating, and then winds from the other storms beat up the rice, followed by an inch of rain from Zeta.

“There’s not much you can do,” Waller concluded.

Because of variations in the weather, there were farmers who were lucky in north Louisiana. In Madison Parish, Garrett Marsh said he was pleased with his 400 acres of row rice.

“It did really well,” he said. “We managed to get most of it out before the hurricanes hit.”

But Marsh said he knew several farmers who weren’t as fortunate, those whose crops were knocked down by at least one tropical weather event.

Keith Collins, LSU AgCenter county agent in Richland Parish, said yields were down by half on many fields.

Dennis Burns, county agent in Tensas Parish, said rice there escaped much of the damage.

“Overall, it was a pretty good year,” he said. “Even my last grower was pleased with his overall.”

He said some farmers had rice that matured early, and it fell from Laura’s winds. “They got it all out without it going down much,” Burns said.

Scott Franklin with Holly Ridge Rice and Grain Terminal near Rayville said some yields were poor because of hurricane damage. He said milling yields were good early in the harvest but fell sharply in October.

Franklin said some fields had lodged rice from thunderstorms before any hurricanes hit.

South Louisiana

Todd Fontenot, county agent in Evangeline Parish, said most farmers were optimistic as the year started well.

“It looked like we were going to have a perfect year,” he said.

The parish was spared from much of the hurricane damage, although northern parts of the parish flooded

from Delta’s rain. However, farmers in Allen Parish had damage, he said.

“It ended up being a pretty good crop for most people,” he said.

Disease and insect pressure were light, he said.

Most of the rice in the parish was harvested before Laura hit, Fontenot said.

He said the second-crop acreage in Evangeline has dipped below 10,000 acres, so the effects of Delta’s winds weren’t as significant there.

Jimmy Meaux, county agent in Calcasieu and Jefferson Davis parishes, said Laura’s wind wreaked havoc on agriculture infrastructure in his area.

“It seemed like water was the main issue with Delta,” he said.

He said a large part of the second crop was submerged.

“Between Iowa and Lake Charles, rice stayed underwater for four or five days,” he said.

Farmers Rice Mill was knocked out of commission by Laura, and it came back online two months later.

Adam Habetz, who farms in Calcasieu Parish near Vinton, said his first crop had an average yield. He got it out of the field just days before Laura slammed the area.

He said his second crop was beaten up by Delta.

“The green kernels just turned black,” he said, but he planned to harvest the crop to see what it yields.

Habetz said the roof of his house was blown away and several windows were knocked out by Laura. Also, a new barn was knocked down.

Yet Habetz said he still feels lucky.

“I’ve seen a lot worse,” he said.

Vince Deshotel, county agent in St. Landry Parish, described 2020 as “probably an average year. Nothing exceptional.”

He said yields averaged around 40 barrels. Some areas in the parish had a better year, he said. However, there were farmers who reported their best year ever.

Deshotel said heavy rain interfered with pollination, which probably depressed yields.

Most rice in the parish was harvested before Laura hit Louisiana, he said, but some that was still in the field got knocked down by winds.

He said rice some second-crop fields were lost to winds from Delta, but ratoon yields of 19 barrels were not unusual.

Jeremy Hebert, county agent in Acadia Parish, said the second crop in west Acadia was damaged by Delta.

“It’s beat up bad,” he said. “It shredded a bunch of rice.”

He said some rice was damaged in the eastern part of the parish, too.

While some farmers have been OK with the second crop, Hebert said others were having to make a difficult choice at harvest.

“I don’t even know if it’s worth cutting,” he said.

The year got off to a good start, but with low prices farmers needed good yields, he said.

“So, we go from a great rice season and then disaster after disaster hit,” he said.

Hebert expects acreage to stay about the same in Acadia, which remained the No. 1 parish for rice acreage in 2020 at 85,710 acres. Jefferson Davis Parish was second with 77,850 acres, and Evangeline was third with 47,964.

Farmer Jackie Loewer of Acadia Parish said his 2020 rice crop was good, but he knows other farmers hurt worse by the storm had significant losses.

“It’s not as good as it could have been, but it’s not as bad as we feared,” he said.

Loewer said the first crop was good. He had high hopes for the second crop, and he was afraid the ratoon loss would be bad after Delta. But as he looked closer, his fields were full of chaff and blank grains.

“It probably wasn’t that good to start with,” he said.

In Vermilion Parish, Andrew Granger, the county agent, said 2020 was far better than 2019.

“It was an excellent crop until the storms came,” he said.

The first-crop yield was above average for most farmers, with an average around 45 barrels, or 162 bushels.

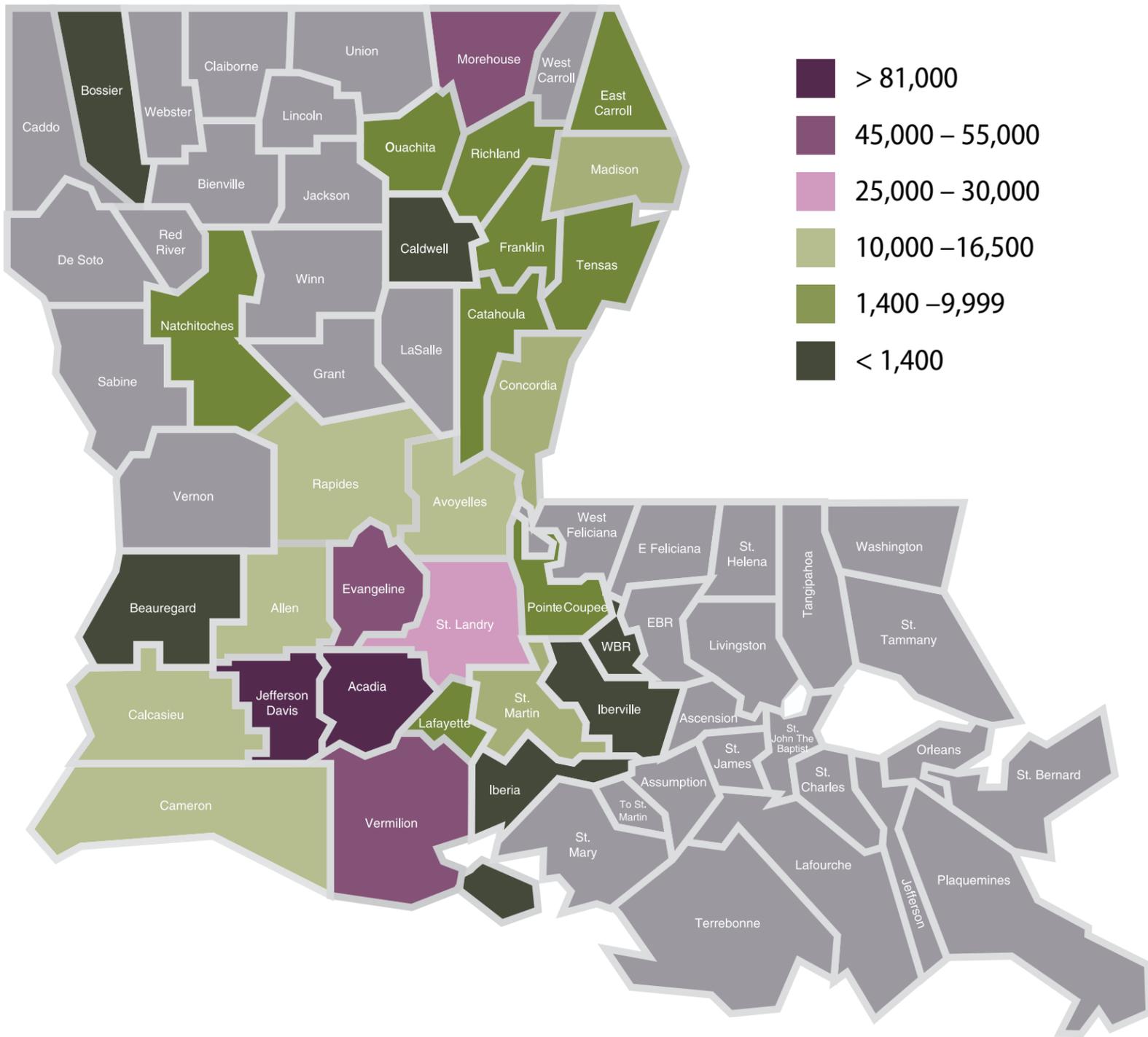
By the time Laura hit Louisiana, almost all the first crop was harvested. Then Delta struck and probably reduced the second-crop yield by half. He said most farmers would have cut at least 15 barrels (54 bushels).

Granger said second-crop rice can be the profit for many farmers. He said now farmers will be looking for crawfish sales to make up the difference, but there was a concern that the crawfish could be threatened by bad, low-oxygen water from Delta.

Farmer Christian Richard of Vermilion Parish said winds from Delta knocked much of his rice off the panicles. One second-crop field he cut only yielded 8 barrels (29 bushels), and he left 800 acres of 2,000 uncut because the rice was beaten up so badly.

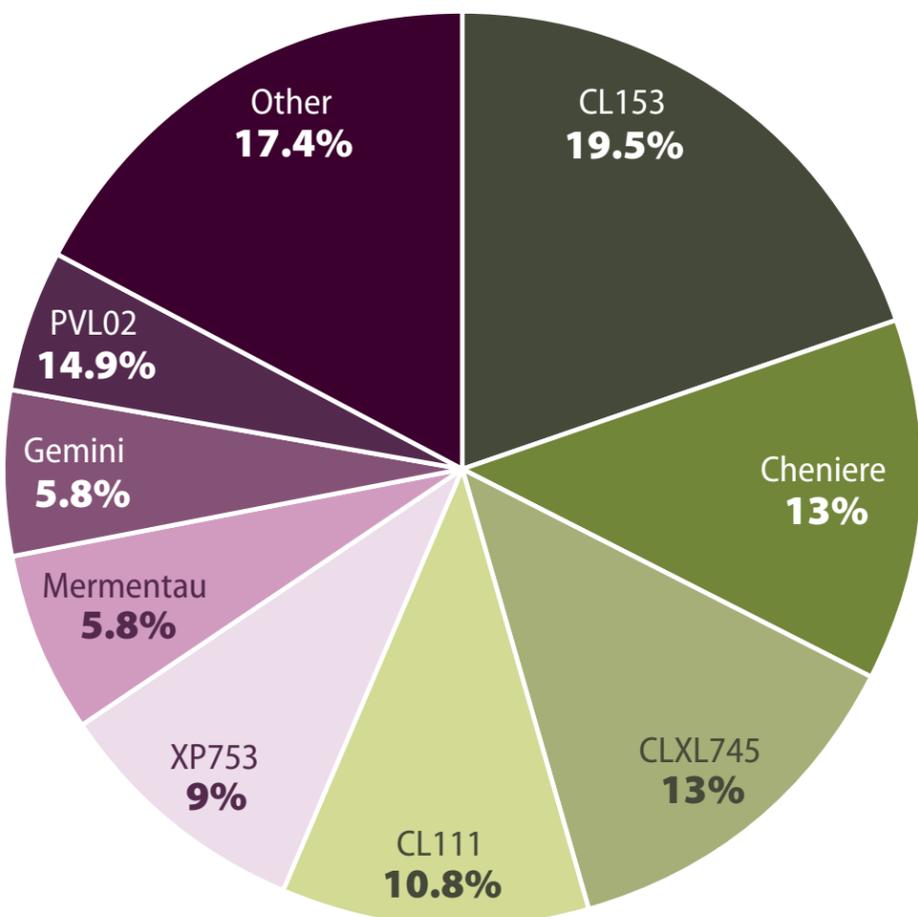
2020 Louisiana Rice Acreage

by Parish, All Types



2020 Louisiana Rice Acreage Long Grain

Top 10 Rice Parishes



Parish	2020 Total Acreage	2019 Total Acreage
Acadia	85,710	84,007
Jefferson Davis	81,850	77,799
Vermilion	53,337	48,483
Morehouse	50,144	33,981
Evangeline	47,964	44,894
St. Landry	26,858	23,354
Avoyelles	16,117	13,778
Allen	15,891	13,431
Cameron	12,426	11,056
Madison	12,134	4,424

2020 Total: 476,497
2019 Total: 418,661



Resident coordinator of the H. Rouse Caffey Rice Research Station Don Groth, at right, conducts disease ratings for different varieties in his plots while Caitlyn DeNux, research associate, records his observations. Groth is retiring at the end of January at the end of almost 38 years as a plant pathologist.

Pathologist: Less disease pressure seen on 2020 crop

The 2020 Louisiana rice crop suffered less disease than the previous year, said Don Groth, LSU AgCenter plant pathologist.

“Disease pressure was not severe, and we saw much less grain smut compared to last year,” Groth said. “This could be due to less favorable environmental conditions in 2020 and the timely application of smut-effective fungicides that were applied to a large percentage of rice fields.”

He said false smut was present in research plots that were not sprayed.

“We planted late due to COVID-19, but nurseries and plots turned out very uniform,” Groth said. “In our disease ratings for Louisiana breeding materials, we saw blast disease ratings from 0 (immune) to 9 (very susceptible).”

Groth said bacterial panicle blight ratings ranged from 2 to 8. He said resistance to bacterial panicle blight is available in the populations that rice breeder Adam Famoso is working with.

He said his plots inoculated with sheath blight had ratings that ranged from 4 to 8.

“What is important is the lines with a sheath blight rating of very susceptible that were common in older varieties and germplasm have been virtually eliminated, and a significant number of moderately susceptible to resistant lines have become common in the breeding populations,” Groth said. “These lines will not require fungicide applications except under very favorable environmental and cultural conditions.”

The bacterial panicle blight resistant lines will not have enough damage to be detected in yield reductions like current susceptible and very susceptible varieties except under hot conditions.

He said a new fungicide, Excalia, appeared to be promising at controlling fungicide-resistant sheath



Don Groth holds a rice panicle infected with false smut disease from one of his test plots that showed the benefits of fungicides to treat the problem. In 2019, farmers reported problems with kernel and false smuts but few farmers had that problem in 2020.

blight fungus in a trial conducted in Calcasieu Parish. “Unfortunately, yield and milling data were confounded or even lost to Hurricane Laura,” Groth said.

Groth said the product has been effective at very low rates of 2 to 3 ounces per acre in previous years.

Fewer fungicides are being tested for rice, he said, “but gains in genetic screening and breeding should help greatly in the near future.”

Groth also said smut fungicide trials showed a striking difference between plots that were sprayed and those that were not treated.

“It was some of the best trials I’ve ever had,” he said. “A night and day difference.”

He said products with propiconazole at 6 to 10 ounces per acre or difenoconazole, one of the active ingredients in Amistar Top, were effective.



Rice in a field for a seed increase approaches maturity at the H. Rouse Caffey Rice Research Station. The breeding department has developed lines of rice that could meet the requirements of Latin American buyers.

Breeders developing lines for Latin American tastes

The breeding program at the H. Rouse Caffey Rice Research Station is developing rice tailored for Latin American palates.

In recent years, buyers in Central and South America have expressed concern that American rice no longer meets their needs.

“Our rice used to be considered high-quality there, and now it’s not,” said Adam Famoso, LSU AgCenter rice breeder.

He said the market is insisting on a long-grain rice with less chalk, along with high amylose that results in a nonsticky texture when cooked. In addition, those buyers want a long grain length, in excess of 7 millimeters.

Famoso said American rice has changed, but so have the preferences of buyers to the south.

“Over the last 10 years or so, concerns over grain quality have become an important topic of discussion, and our industry is trying to address these concerns,” Famoso said.

Famoso began work in 2018 to develop a variety that would meet the needs of those customers. In 2019, doctoral student Raul Guerra joined the project to focus specifically on this topic.

“Raul’s work is to help define what our target cooking profile should be to meet the expectations of the Latin American export market,” Famoso said. “This work is being supported by USA Rice as a foundational step to maximize the efficiency of our breeding efforts.”

Famoso and his crew started by making breeding populations between low-chalk Clearfield Jazzman lines and CL163, a Mississippi high amylose line. Brijesh Angira used his genetic marker expertise to screen more than 6,000 F2 and F3 plants to select

only plants that were fixed for high amylose, low gel temp and no aroma. Instead of growing those crosses to maturity, leaf sample tissue was used to genetically screen the crosses for amylose, gel temperature and chalk.

“It allows us to throw away everything that is not desired,” Famoso said.

Famoso said marker-assisted selection was key to streamlining the breeding process and eliminating three years of tedious work.

“We’re hopeful that at least one variety will come out of these,” he said.

The result was 200 lines screened for planting in Puerto Rico. Those 200 were further reduced to 140, and these 140 lines were evaluated in 2020 for agronomic and grain quality and cooking characteristics. Researchers will select the top 30 to 40 lines for multilocation testing in 2021.

In addition, he said one line, LA2126, is closer to release and shows the most potential of the high amylose material. It is being grown now in Puerto Rico for more seed and purification.

Costa Rican buyers have expressed interest in trying that line, Famoso said, and based on their findings it could be further refined into a variety, perhaps as soon as 2023.

“We have five or six other advanced lines that are candidates to better meet their expectations,” he said.

Famoso said the lines also could be potential parents for future crosses.

He detailed his work on this topic during a USA Rice symposium in October that brought industry representatives from the U.S. and Latin America together to discuss the quality issues of American rice.



Brent Theunissen

Theunissen selected as rice station farm manager

Brent Theunissen is the new farm manager at the H. Rouse Caffey Rice Research Station.

He assumed the new job in April with the retirement of Bill Leonards.

The job is “everything you do on a farm,” Theunissen said.

Theunissen ensures all the field work is carried out for research projects to be conducted. During the winter months Theunissen’s crew will be in the fields, plowing and laser-leveling, then pulling levees and preparing the ground for planting.

During the growing season, the farm crew will make sure irrigation is provided for the research projects, maintain the station’s roads, trim trees and cut grass. It assists with harvest and then clean seed for the Foundation Seed Department.

“All the projects come through us,” Theunissen said. “If they need water, they come to us.”

Theunissen started working at the Rice Research Station in January 1999 with the breeding program under Steve Linscombe, and about three years ago he moved over to the farm crew.

Farming is second nature for Theunissen. His dad, Sam Theunissen, works with farmer Buck Leonards adjacent to the station, and Brent Theunissen helped them plant, grow and harvest rice.

“That’s what I grew up doing since I was a kid,” Brent Theunissen said.

He graduated from the University of Southwestern Louisiana (now the University of Louisiana at Lafayette) with a business administration degree in 1997. He and his wife, Amanda, have two children, Brant and Krysten.

Don Groth, resident coordinator of the station when Brent Theunissen was chosen for the new job, said the new farm manager did an admirable job in his first year.

“He was the right choice for that position,” Groth said.

Groth said because Brent Theunissen was assistant farm manager under Leonards, the transition went well.

“Brent is a real asset to the station,” Groth said. “He’s very progressive and looks at ways to be more efficient.”

Four fields enrolled in AgCenter Rice Verification Program

Four fields were enrolled in the LSU AgCenter Rice Verification Program in 2020. The program helps farmers learn the finer points of growing rice, starting with field preparation and working through harvest. County agents and crop consultants help participants make plans and make observations from weekly scouting of the fields.

In Vermilion Parish, a 30-acre field near Wright was planted April 13 with CLI53. It yielded 47.7 barrels, dried down to 12% moisture, or 171 bushels.

In Jefferson Davis Parish, a 9.5-acre field near Lacassine was planted April 17 with Jupiter. The yield was 41.5 barrels or 149 bushels.

In Acadia Parish, a 42-acre field near Mowata was planted March 13 with CLXL7321. Its yield was 40 barrels or 145 bushels.

In Evangeline Parish, a 46-acre field was planted with Cheniere on April 3. The field produced 54.6 barrels or 197 bushels.

A fifth field was planned for north Louisiana in Morehouse Parish, but it was scratched because of flooding problems at planting time.

Three of the fields were water-planted, but planting at the Evangeline Parish field was accomplished by flying the seed on dry ground and harrowing it into the soil.

"Most of the farmers were pleased with the yields," said Keith Fontenot, research associate for the program.

He said no second crop was harvested on any of the four fields because the rice was kept for crawfish.

For 2021, he said the program will include the same fields in Evangeline, Acadia and Jefferson Davis parishes, along with fields in Allen and Morehouse parishes.



Farmer Jeremy Craton, center, walks his field with Evangeline Parish County Agent Todd Fontenot, at left, and Keith Fontenot of the LSU AgCenter Rice Verification Program. Craton's field will be in the program again in 2021, along with fields in Vermilion, Allen, Jefferson Davis and Morehouse parishes.

Leaf spot on radar

Jonathan Richards, LSU AgCenter plant pathologist, is studying narrow brown leaf spot disease, which is also called *Cercospora* leaf spot, and the different ways that farmers could control it.

Richards said the disease has the potential to decrease yields by 10% to 40%. A bad outbreak occurred in 2006 throughout Louisiana.

"It has been increasing in incidence in recent years," Richards said.

Richards said the disease is more prevalent late in the season.

"It's usually in the ratoon crop where it can become a really big problem," he said.

Richards said he is looking to determine which rice varieties have resistance. He also is working to identify the different races of the pathogen in Louisiana.

In addition, he is studying control of the disease with fungicides. He said some isolates collected in Louisiana have developed resistance to strobilurin fungicides. He also is working to determine if resistance to propiconazole has developed.

Richards said he is working with AgCenter rice breeder Adam Famoso to identify genetic markers linked to resistance to narrow brown leaf spot.

He said he has collected over 300 isolates of the fungus that causes narrow brown leaf spot, and next year that effort will include sampling in north Louisiana. Richards said he also plans to study the disease in row rice.

Plant pathologist studying diseases in north Louisiana

Trey Price, LSU AgCenter plant pathologist, is working at the AgCenter Macon Ridge Research Station on rice diseases in north Louisiana and how to manage them.

Price has been growing rice for seed treatment and foliar fungicide efficacy trials since 2014. In 2020, he included row rice in his project, and that enabled him to study the efficacy of products in flooded versus furrow-irrigated conditions.

In 2020, he had 330 plots with six trials at Macon Ridge, which is near Winnsboro. Varieties CLI63, Jupiter and Cheniere were grown under flooded and furrow-irrigated conditions. Labeled fungicides tested were Amistar Top; Artisan; Elegia; Flint, which has the same active ingredient as Gem; Quadris; Quilt Xcel; Stratego; Sercadis; and Tilt.

One experimental sheath blight material showed promise in his plots, but Price said there is currently no label for its commercial use in rice.

He said the experimental compound has a similar mode of action as Sercadis, Elegia and Artisan.

"It worked well on sheath blight," Price said. "The product is labeled in soybeans as Excalia, and I've seen it work very well on resistant aerial blight in soybeans."

Price said his work complements disease research conducted in south Louisiana at the H. Rouse Caffey Rice Research Station near Crowley.

"It's always good to have more locations and different environments," he said.

Row rice increases the possibility of developing blast disease because the crop is grown in somewhat upland conditions.

He said the varieties Jupiter and CLI63 are somewhat popular in north Louisiana, even though they are



blast susceptible. Some newer hybrids have moderate resistance, he said.

Strobilurin-containing fungicide applications for blast are best when applied at 50% to 70% panicle emergence, he said. The window for that can be very tight, two to seven days depending on the weather.

"You have to scout carefully, especially if you have a susceptible variety, weather conducive for disease development and upland conditions," Price said.

Price attempts to induce blast in his test plots by creating situations that will create a favorable environment for the disease.

"In research plots you try to set yourself up to increase the chances of disease development," he said.

In addition to working on his plots, Price said he also assists the breeding project by maintaining test plots planted by AgCenter breeder Adam Famoso.

Price also worked with Prasanta Subudhi to test six salt-tolerant lines using irrigation water from a well with high salinity levels.



Jim Oard, LSU AgCenter hybrid breeder, inspects a plot of an experimental hybrid line. Oard has developed several lines that have potential for commercial release.

New hybrid combinations show promise in testing

Four new hybrid combinations developed at the LSU AgCenter H. Rouse Caffey Rice Research Station showed highly promising results in 2020.

“We made good progress this year developing new hybrid combinations for the Louisiana rice industry,” said Jim Oard, AgCenter hybrid rice breeder. “With these new candidate hybrids, we’ve upped the game.”

The hybrid breeding program grew roughly 20,000 small-plot rows in 2020.

Two early maturing Clearfield long-grain lines, CLH134 and CLH103, were tested at the Rice Research Station and at the station’s South Farm.

Both lines have good grain quality, and they showed an average 12% yield increase over LAH169, an LSU AgCenter hybrid that had shown promise in recent years. Oard said the lines also showed a 15% yield advantage over conventional Clearfield varieties CL111, CL153 and CL151.

“We will continue to evaluate these lines next year,” Oard said.

He said two new Provisia hybrids, PVL148 and PVL149, tested in 2020 showed good yield potential comparable to many commercially available hybrids.

He said the line grown in a trial at the South Farm had a 30% yield advantage over PVL02 and a 20% yield advantage over LAH169.



Democ Rebong, a Ph.D. student, inspects panicles used to produce hybrid F1 seed in isolation. The plastic barriers are used to prevent cross-pollination from other hybrid plants.

The Provisia hybrids have good grain length and low chalk, he said. The hybrid program in 2021 will continue to work with the Provisia and

Clearfield lines in preliminary yield trials, Oard said. He said an additional 500 new combinations will be tested.

Economists project weaker rice prices in 2021

The past year for the rice market has been a roller coaster.

“You can’t talk about the marketing year and not talk about trade and COVID,” said Michael Deliberto, LSU AgCenter economist.

Rice future prices increased dramatically to about \$22 per hundredweight (\$35.64 per barrel or \$9.90 a bushel) during the summer, he said, but “that was the result of limited supply of old rice.”

However, that price seldom made it to the cash market, he said, and most farmers had already sold their 2019 crop.

Exports to Iraq and Central America also gave American rice a boost, he said, and prices also increased after panic buying caused by the COVID-19 pandemic. Food supply concerns spurred a buying spree.

Speculators entered the rice market, and that boosted prices more during the pandemic, he said.

But overseas trade for American rice fell off later in the year, and the high prices caused foreign buyers to delay purchases, he said.

September prices settled around \$12-12.50 per cwt. (\$5.40-\$5.63 per bushel, \$19.44-\$20.25 per barrel), which was reflective of new crop growing conditions and anticipated supplies.

For 2021, Deliberto said weaker prices are projected by the U.S. Department of Agriculture, with an estimate of \$11.50 per cwt. (\$18.63 a barrel, \$5.18 a bushel) compared to \$12 last year (\$5.40 per bushel or \$19.44 per barrel) for long-grain rice.

Prices have fallen because of the good harvest this year coupled with the increased acreage in all rice-growing states.

Louisiana acreage increased to 476,000 acres compared to 410,000 in 2019.

On the export side, Mexico remains the dominant buyer of American rice. Deliberto said Mexican purchases increased by 8%, and the rest of Latin America continues to buy American rice.

Total U.S. rice exports in 2020-21 are projected to be 5% larger than a year earlier and the highest since 2016-17, Deliberto said. Long-grain exports are projected 10% larger than a year earlier. The year-to-year increase in U.S. long-grain exports is based on larger supplies and expectations of more competitive U.S. prices with South American exporters.

In addition to large U.S. sales to Brazil early in the 2020-21 marketing year, Deliberto said a current extremely tight supply situation will exist in the MERCOSUR rice exporting countries (Argentina, Brazil, Paraguay and Uruguay) until their spring 2021 harvest is complete, likely boosting U.S. sales to Latin America over the next several months.

But he said there are challengers to the domestic U.S. market.

He said speculation that Iraq will announce a rice tender provides positive price speculation for the market and raises the question whether infrequent export demand for U.S. rice can materialize into an established export market.

Meanwhile, U.S. rice producers continue to face competition from overseas.

“Rice imports continue to be elevated year after year,” he said.

Imports of rice from Thailand, India and Brazil were significant last year, he said.

The 2020-21 upward revision for imports — all for long-grain — was largely based on strong purchases from Thailand, India and Brazil in August and expectations that U.S. purchases from these sellers will remain strong the remainder of the market year.

Most of Thailand’s sales in the U.S. are for aromatic Jasmine rice, although an LSU AgCenter Jasmine-type alternative, Jazzman, is available in the U.S. Much of the Indian import is for basmati rice.

Brazil regularly ships nonaromatic long-grain rice to the United States, mostly whole-grain white rice but also smaller quantities of broken-kernel rice for processed uses, Deliberto said.

Brazilian rice exports are occurring at an accelerated pace because that country’s currency has been devalued by 30%, he said, making Brazilian rice more competitive in the global market.

Deliberto said Brazil also has made strong sales in Africa and other Western Hemisphere countries because of Brazil’s devalued currency, the real.

“The market is weighing whether or not the exportable supplies from that country can satisfy foreign demand,” he said. “Interestingly, any potential shortfall in Brazilian exportable supply may force South American buyers turning to the U.S. for rice needs.”

In early September, the United States sold 30,000 tons of long-grain rough rice to Brazil, the first significant rice sale there since September 2010. Brazil is importing rice from the U.S. in the interim period to comply with the country’s import tariff exception status through the end of the calendar year.

Weed scientist studies Provisia, Loyant technologies

Research focusing on the Provisia technology was a major part of the work by LSU AgCenter weed scientist Eric Webster in 2020.

Provisia offers hope for farmers dealing with bad red rice and outcrossing problems with weedy rice, Webster said, but the technology needs to be managed properly.

He said the improved yield of PVL02 over PVL01 will probably persuade farmers to consider the new option.

“In 2021, I expect to see a lot more Provisia planted, but you can’t get careless with it,” he said. “You have to address problems immediately.”

He said escapes have to be removed as soon as they appear, and farmers should avoid back-to-back years of planting Provisia just like the advisory for Clearfield stressed rotating other varieties and crops.

Webster said he recommends a third application of the Provisia herbicide to control late-season problems. Provisia is limited to 31 ounces per season, so that amounts to three applications of 10 ounces per acre, he said.

He said his work also involves controlling late and early weed problems with Provisia.

Webster is also studying weed control methods with the row rice system at the AgCenter H. Rouse Caffey Rice Research Station and at the St. Joseph Research Station. Webster said the lack of standing water brings new weed problems found in a dryland setting, but most rice herbicides were developed for a flood. More goosegrass, johnsongrass and pigweeds are likely with rice grown in an upland system, he said.



Eric Webster, second from right, and his crew place rings in test plots used to study the herbicide Loyant on aquatic weeds. Shown in the water are, left to right, students Connor Webster and David Walker, Webster and student Sam Rustom. Near the trailer, left to right, are John Sonnier, student Bradley Greer and Meera Patel.

Webster’s research also included more work on the Loyant herbicide, and that included applying the herbicide on urea fertilizer. Although that technique is not as effective as applying the chemical in a spray, it does prevent drift problems.

Webster said more growers are returning to conventional varieties because of lower seed costs and because Clearfield has reduced

effectiveness, and they are using water seeding for the weed control.

He said fimbriatilis, a sedgelike weed, became more widespread in rice fields in 2020, and controlling that weed is best achieved with herbicides such as propanil and Basagran.

“It tends to be more of an early season problem,” he said.

Row rice growing in popularity in north Louisiana

Row rice continues to gain in popularity in north Louisiana, where farmers are taking advantage of the growing technique's flexibility — it requires no need for levees and allows for potential water savings.

The LSU AgCenter has several research projects to help farmers with this new method.

Dustin Harrell, LSU AgCenter extension rice specialist, estimates that row rice acreage totaled 35,000 in 2020, compared to 15,000 in 2019.

County agents Keith Collins in Richland, Dennis Burns in Tensas and Bruce Garner in Morehouse worked with farmers with on-farm demonstrations.

"Our objective was to help figure out some best management practices, and the big one is water," Collins said. "I think we've got a firm handle on how to grow it."

Collins, who is retiring this January, said more work is needed to determine how little water is needed, particularly on clay soils, and to fine-tune nitrogen applications and timing.

"If row rice is here to stay, we need to know more about it," Collins said. "I don't see us going the other way."

He said row rice requires more management but it has an obvious advantage.

"If you ask farmers, the first response is, 'No levees,'" Collins said.

Scott Franklin of Holly Ridge Rice and Grain Terminal near Rayville said many farmers were encouraged to grow row rice because crop insurance coverage was approved starting with the 2020 crop.

"That changed the game and made it bankable," Franklin said.

He said banks wouldn't make crop loans without insurance before.

"The word right now is people who grew row rice are hooked on it and they'll grow more acres," Franklin said.

Collins said the Richland Parish field farmed by Elliot Colvin yielded about 175 bushels (49 barrels) on the hybrids, while conventional varieties were about 20-30 bushels fewer than the hybrids. He said that was surprising, "considering what this rice has been through."

Collins explained that hurricanes Laura and Delta beat up the crop that also received 18-20 inches of rainfall. The field was planted June 2.

"Our varieties we cut, including the hybrids, were about half of what they should be," Collins said.

He said much of the rice in the Richland Parish field was knocked down by Hurricane Delta.

Collins said the 92,000 acres of rice in northeast Louisiana were an increase of more than 30,000 acres, and he said the jump was related to the low prices of other commodities at planting.

Bruce Garner said the results of the project at Jason Waller's farm in Morehouse Parish as well as other farmers' fields was "kind of heartbreaking."

He said the rice was in the flowering stage when Hurricane Laura interfered with pollination. Everything was done on time, he said, but the rice couldn't overcome the damage from the first storm.

Before the storm, he thought the crop would do well.

"The plots looked great," he said. "That's what's so frustrating about it."

Then came Delta, and much of the rice lodged, especially the variety Diamond and CL16, but he said CL153 stood well.

Garner said the best yield came from the hybrid XL7521 with 117 bushels per acre, or 33 barrels. Conventional varieties came in at 60-80 bushels (17-22.5 barrels), he said.

"It was horrible," Garner said.

The plots were planted late on May 23 because of wet weather in early May, he said, and that put the crop in the Laura's crosshairs.



Poly pipe is used on the Jason Waller Farm near Mer Rouge to irrigate a field of row rice. The area suffered from the effects of hurricanes and a tropical storm that hurt yields. This field on Waller's farm was part of a study conducted on row rice, a method gaining widespread use in northeast Louisiana.

Burns said the 36-acre field on the Heath Herring farm in Tensas Parish was cut in early October, and it yielded about 160 bushels (45 barrels) of Gemini hybrid.

Burns said disease and insect and weed pressure were no worse than usual.

He said using a roller-groover on the soil helped promote even emergence and drainage.

"Everything was more uniform," Burns said.

Prior to heading the field had only received 1 4.8 acre-inches of irrigation water. After heading the field was watered about every four days at a slow rate to make sure the heavy clay soil was adequately moistened.

"He did not hold the water on that field," he said.

Fertilization of 200 pounds of nitrogen was applied in five applications, first as a starter, and then four more shots one week apart starting at early tiller.

Burns said Herring did have a problem with the pipe busting.

"By the end of the summer, it starts to tear. When that pipe gets hot, it stretches and gets thin," Burns said.

He said the pipe can be patched but it requires monitoring when the pump is running.

Burns also has been working on a project to inject fertilizer into irrigation water carried by poly pipe.

This was the project's second year, and Burns said the results look promising.

"We took what we learned the first year and modified our techniques and application and it did a much better job," Burns said.

The 1.5-acre test plots on 6 acres at the St. Joseph Research Station were harvested Oct. 22. One plot was continuously flooded, and fertilizer was applied conventionally in a single application.

There were three treatments compared to the standard flooded plot. Two of them were

mimicking the farmer standard of applying three split applications of 46 pounds of urea at one-week intervals. The difference in the farmer standards was holding or not holding floodwater. The other plot was fertilized at the same rate and time interval by injecting fertilizer into the irrigation water being carried by poly pipe.

Yield results were inconclusive because of heavy bird damage right before harvest. Aerial imagery showed a more uniform nitrogen application than 2019.

He said the urea ammonium nitrate (UAN) fertilizer, 32%, was applied in the poly pipe three times during the growing season at the rate of 45 pounds per acre, roughly the same amount that farmers use in north Louisiana.

"We try to mimic what the farmers are doing as close as possible," Burns said.

In 2019, the fertilizer was injected into the water as pumping began, but this year the injections were not made until the poly pipe was full of water, he said.

"You could tell looking at it that it was much more uniform than the year before," he said.

Burns said the project was carried out on a field that previously was used to grow soybeans. The ground was leveled, and then a roller-groover was used to make channels for the water 38 inches apart.

Burns said water samples were taken after the fertilizer was injected into the water, which took about two minutes, and the fertilizer distribution was much more uniform than last year.

Burns said he's not aware of any farmers using this fertilization process in Louisiana. He said the idea came about when a corn farmer asked R.L. Frazier, county agent in Madison Parish, about the possibility of using it in corn.

Pests threatening row rice, traditional rice studied

Research for insect pests of rice continued in 2020 with the addition of a project to study an emerging pest for row rice.

Blake Wilson, LSU AgCenter entomologist, said billbugs have become more of a problem.

"They've emerged as a serious threat to row rice," Wilson said.

He said a trial at the St. Joseph Research Station shows billbugs can cause a 10%-20% yield loss if left unprotected.

Wilson said seed treatments don't seem to be effective, but an insecticide, Belay, offers a remedy.

"That was effective at controlling infestations and reducing them," he said.

Wilson said the row rice technique has created new research needs, and "we're having to learn as we go with row rice."

Billbug damage results in whiteheads similar to the sign of stem borer feeding.

"You won't see the larvae until you see the damage," Wilson said.

Wilson said Belay applied at green ring seems to work when it is used preemptively.

"We don't know much about the timing," he said.

More work with the project will be done in 2021 at the St. Joseph facility.

Wilson said his work in 2020 included studying the increasing range of apple snails. For the first time, he said, a rice crop was affected by the invasive species. The snails fed on emerging rice plants, but the farmer had water-seeded his crop into a field with a heavy snail infestation. Wilson said.

Hurricane Laura appeared to move the snails into new areas along the Vermilion River, he said. He said snails usually are spread with irrigation water.

Wilson said it is hoped that a new foliar pesticide will be available for stem borers.

Wilson will continue his work on stored rice pests, and one study is looking at the susceptibility of varieties to the insects. For example, he said, the hybrid XP753 has 10 times the damage of varieties Caffey and Mermentau from stored grain pests. The primary insects are rice weevils and the lesser grain borer.

Wilson said the second year of a study has shown that weevil damage can be detected by drone.

Louisiana Rice Research-January 2021

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www.lsuagcenter.com/topics/crops/rice.

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Louisiana Rice Research Board and the LSU AgCenter
P.O. Box 25100
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Rice Research Projects for 2021

CONTINUING PROJECTS

Agricultural Economics and Agribusiness

\$40,000
Economic Analysis of Rice Production and Farm Management in Louisiana
Michael Deliberto

Entomology

\$112,100
Integrated Management Strategies for Insect Pests of Rice
Blake Wilson

Experimental Statistics

Extension of 2020 funded project
Implementation of Digital Agricultural Techniques to Improve Outcomes and Practices at the Rice Research Station
Thanos Gentimis

Bob R. Jones Idlewild Research Station

\$10,000
Development of an Encapsulation Protocol for Sodium Nitrite for Control of Feral Swine in Rice
Glen Gentry

Macon Ridge Research Station

\$35,000
Evaluation of Fungicides on Important Rice Diseases Under Upland (Row Rice) Condition
Trey Price

Northeast Research Station

\$45,000
Yield Evaluation of Commercial-Advanced Testing Program in Northeast Louisiana
Dennis Burns

Best Management Practices for Row Rice Production Systems in Northeast Louisiana
Donnie Miller and Bruce Garner

H. Rouse Caffey Rice Research Station

\$1,238,161

Applied Molecular Breeding
Brijesh Angira

Multiple Generation Rice Breeding Nursery
Adam Famoso

Development of Superior Rice Varieties for Louisiana
Adam Famoso

Enhancement of Rice Research and Extension Communications
Frankie Gould

Development of Disease Control Practices in Rice
Don Groth

Rice Management Strategies for Efficient Utilization of Agronomic Inputs and Natural Resources
Dustin Harrell

Louisiana Rice Research Verification Program
Dustin Harrell

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

Development of Hybrid Rice and Sheath Blight-Resistant Germplasm for Louisiana
James Oard

Rice Grain Quality Enhancement: Characterization of Elite High-Protein Lines and Development of Herbicide-Resistant Rice
Ida Wenefrida

School of Plant, Environmental and Soil Sciences

\$207,648

Remote-Sensing Ground Control Point Network to Support Precision Agriculture in Rice Farms
Luciano Shiratsuchi

Weed Management in Herbicide-Resistant/Tolerant and Conventional Rice
Eric Webster

NEW PROJECTS

Plant Pathology and Crop Physiology

\$32,200

Improvement of Management Strategies for Narrow Brown Leaf Spot of Rice
Jonathan Richards

OTHER PROJECTS

\$20,000

Black Bird Research
William Futch

\$22,100

Latin America Taste Preference Study
Steve Linscombe

TOTAL

Total funding for 2021: \$1,762,209