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H. Rouse Caffey RICE RESEARCH STATION NEWS

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1909-2015
52 released varieties

Southwest Region

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PROVISIA VARIETY DEVELOPMENT UPDATE

The Provisia rice system is a new tool for rice producers to control post-emergence grasses, including weedy rice. The Provisia rice system was developed by BASF, and the first rice varieties containing the Provisia trait have been developed by the LSU AgCenter at the H. Rouse Caffey Rice Research Station. The Provisia trait confers resistance to the Provisia herbicide, which contains the active ingredient quizalofop, an AACase (group 1) herbicide. Provisia varieties will be available through Horizon Ag.

This technology is an excellent complement to the Clearfield production system in that it will help control weedy rice that has developed resistance to the Clearfield system because of outcrossing. Like the Clearfield production system, all research and development of the technology and the varieties was done through traditional methods and is non-GMO.

The first Provisia variety, PVL01 is scheduled to be released in 2018. PVL01 is a semidwarf, glabrous, long-grain variety with typical long-grain cooking qualities. It is of similar height to Mermentau and CL111, and is nine days later than CL111 and seven days later than Mermentau in days to 50 percent heading. PVL01 is rated as susceptible to blast and bacterial blight, moderately susceptible to sheath blight and moderately resistant to *Cercospora.* PVL01 has demonstrated good milling yields and excellent grain appearance with low chalk. PVL01 is unique among our existing varieties, with a milled grain over 7 millimeters, which is required for some export markets. The yield has been lower than our commonly grown varieties, with the average yields about 5 to 10 percent below our highest yielding Clearfield and conventional varieties. In limited testing, it has shown good ratoon potential.

Yield testing plot of PVL01. PVL01 is the first released variety with resistance to Provisia herbicide. It is a semi dwarf, long grain variety.

PVL01 was developed in an expediated timeframe, with the initial cross being made in 2012 between Cheniere and the Provisia donor line. The original Provisia donor line was a pubescent *Indica* type that was unadapted to the Louisiana environment and did not possess the typical southern U.S. long-grain cooking qualities. The development of PVL01 was facilitated through extensive use of the winter nursery in Puerto Rico.

In addition to PVL01, there are other Provisia lines being evaluated in advance yield tests across the state. One of the lines showing potential is PVL108, which has demonstrated slight yield advantages over PVL01 and very good milling yields. All the Provisia lines in advanced testing have the original Provisia donor as a parent.

In 2018 we expect to test five new "second generation" Provisia lines in multi-location yield tests. These lines have been developed with improved Provisia lines as a parent. These new experimental lines have been developed through continued backcrossing to adapted lines. Each line has been crossed three to four times to our elite Louisiana varieties, thus some of the inherit limitations of the original Provisia *Indica* line will be reduced. Based on DNA marker analysis, we anticipate good blast resistance in each of these lines.

Going forward, in 2019 and beyond, we anticipate all our new experimental Provisia lines to be second generation lines. This will facilitate populations that are much more adapted and suitable for our environment and will enable us to increase the number of new experimental lines tested each year.

In summary, the Provisia rice system will be an excellent tool for rice producers and will extend the life of the Clearfield technology. The first Provisia line, PVL01, appears to be a very good initial line that will be very well suited for producers with fields that have problems with Clearfield-resistant weedy rice. This line was developed very rapidly to enable producers to utilize this important technology as soon as possible. There are new Provisia experimental lines in the research pipeline. We are focused on increasing the yield and disease resistance while maintaining the grain quality that is found in PVL01.

PVL01 has a longer grain than other long grain varieties and also has an excellent grain appearance.

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Special Dates of Interest:

- **2017 USA Rice Outlook Conference**
  December 10-12, 2017, San Antonio, TX
- **H. Rouse Caffey Rice Research Station Annual Field Day**
  June 27, 2018

Rice Fungicide Resistance Management

Amistar Top received full federal and state labels late this summer and will be commercially available for rice in 2018. It is a prepackaged tank mix of Azoxystrobin, the active ingredient in Quadris, and the new Triazole difenoconazole. It can be applied from panicle initiation to 28 days preharvest which includes heading. It has good activity against the wild (non-fungicide resistant) and both fungicide-resistant types of the sheath blight fungi. It also has good activity against blast and Cercospora. It will be an excellent new tool in our rice disease control arsenal. Make sure you read and follow the label instructions and restrictions.

Now that Amistar Top is labeled, there are three effective modes of fungicide action for rice sheath blight, based on the Fungicide Resistance Action Committee (FRAC) classification. They are the strobilurins (FRAC Group 11), SDHIs (FRAC Group 7) and the Triazoles (FRAC Group 3). Strobilurin resistance developed in the sheath blight fungal population several years ago and has been spreading in southwest Louisiana. This has caused farmers to stop using the strobilurin fungicides and start using different modes of action. The best time to use an alternate mode of action fungicide like Sercadis, Elegia or Amistar Top is before resistance develops. Alternating fungicide modes of action or tank mixing them should delay or prevent resistance from developing. Also, full labeled rates should be used to help prevent fungicide resistance.

Amistar Top applied to fungicide resistant sheath blight

Once fungicide resistance develops to one type of fungicide, another will have to be used. If you have strobilurins resistance, which is most common, you have to use either a SDHI, such as Sercadis or Elegia, or the Triazole Amistar Top to control sheath blight. Limited data shows SDHI fungal resistance is developing in some fields where that fungicide class has been used extensively. Amistar Top can be used to control both strobilurin and SDHI resistant sheath blight fungi. If Amistar Top or any other fungicide is used exclusively season after season, resistance to that fungicide will likely develop. Let's be proactive rather than reactive in dealing with the rice pathogen fungicide resistance by rotating fungicides.

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Rice Station Positions Announced

Dr. Don Groth is the new director of the H. Rouse Caffey Rice Research Station.

Dr. Kurt Guidry, director of the LSU AgCenter's Southwest Region, made the announcement Tuesday (Oct. 31) at the Louisiana Rice Research Board meeting.

Guidry also announced that Dr. Dustin Harrell is the station's assistant director, a position that Groth previously held.

"We're excited about having both of these outstanding scientists in their new roles," Guidry told the board.

Groth has worked at the Rice Research Station for 34 years. He replaces Dr. Steve Linscombe, who retired Oct. 1.

Groth earned his bachelor's degree in botany from Eastern Illinois University, and his master's and doctorate from Iowa State University.

"I'm eager to working with the rice industry, and continuing the success of the station," Groth said.

Harrell, the extension rice specialist and research agronomist, obtained his bachelor's degree from Texas A&M in agriculture science, his master's degree from Stephen F. Austin State University in soil fertility and his doctorate from LSU in soil fertility and chemistry.

He has worked at the Rice Research Station since 2006. Previously, he was high school science teacher, and a soil scientist for the U.S. Department of Agriculture.

"I look forward to the opportunity to help provide leadership for the Rice Station going forward," Harrell said.

Dr. Rogers Leonard, LSU AgCenter associate vice president for plants, soils and water, said Groth and Harrell will continue the tradition of excellence at the station.

Leonard said Groth will have administrative oversight for all fiscal and physical resources at the station. "His institutional history with the faculty and staff of the Station will make the transition from Dr. Linscombe' s leadership much easier."

He said Harrell will be the station's research coordinator to support all research efforts of faculty with projects at the station.

Both of these scientists will maintain most of their current responsibilities for research and extension activities, Leonard said.

Dr. Don Groth, at right, is the new director of the H. Rouse Caffey Rice Research Station while Dr. Dustin Harrell is the new assistant director. Both will continue their research and extension work with Groth working in plant pathology and Harrell maintaining his agronomy projects.

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New Herbicide Options for 2018

Rice production has been blessed in the past 20 to 25 years with a large number of herbicides labeled for use in rice. There were several new herbicides labeled in 2017. Below is a brief discussion of each of the new herbicides.

In the spring of 2017, RiceCo received a label for RiceOne. This new herbicide is a prepackaged mixture of clomazone plus pendimethalin. Due to the presence of pendimethalin in the mixture, this herbicide cannot be applied as a preemergence treatment immediately after planting. This herbicide mixture controls barnyardgrass, broadleaf signalgrass, Amazon sprangletop and fall panicum prior to weed emergence. RiceOne also has activity on many small-seeded broadleaf weeds when applied prior to weed emergence. RiceOne may be applied as a surface broadcast application as a delayed preemergence application or as an early postemergence treatment to rice. Early postemergence applications will need another herbicide to control emerged weeds. RiceOne rates are soil texture dependent; therefore, refer to the RiceOne label for proper rates. Do not apply RiceOne to water-seeded rice.

In early October, Gowan received a label for Gambit. This new herbicide is a prepackaged mixture of halosulfuron plus prosulfuron. Gambit should be applied at a rate of 1 to 2 ounces per acre under dry or flooded conditions. Do not apply more than 2 ounces per acre per year. Refer to label for approved adjuvants. Gambit controls broadleaf weeds and sedges. Apply to actively growing broadleaf weeds in the one- to three-leaf stage, and sedges in the three- to six-leaf stage. If applied under flooded conditions, weeds should be exposed above the flood 70 to 80 percent. Do not flush or flood within 24 hours after application. Hold flood water for 14 days after application, and do not apply within 48 days of harvest.

In early October, Dow AgroSciences received a label for Loyant. The active ingredient in Loyant is florpyrauxifen-benzyl. Loyant can be applied to both drill- and water-seeded rice in the two-leaf stage at a rate of 1 pint per acre. A methylated seed oil (MSO) at 0.5 pints per acre is required. Wait at least 14 days between Loyant applications, and do not apply more than 2 pints per acre per year. Loyant controls most broadleaf and sedge weeds found in rice, including many aquatic broadleaf weeds. Loyant has no activity on Texasweed. Loyant has activity on small barnyardgrass, broadleaf signalgrass, junglerice and Amazon sprangletop no larger than the three- to five-leaf stage. Apply to small, actively growing weeds. If the flood is not present at application, establish permanent flood within three days. If the permanent flood is present at application, make sure weeds are exposed 70 percent above water level, and wait three hours before adding more water. Loyant has no residual activity on weeds that have yet to emerge. Avoid the use of Loyant on freshly cut or leveled ground, except water-leveled fields. Loyant has auxin activity similar to 2,4-D or Grandstand; therefore, caution should be taken to avoid drift to neighboring soybeans and other broadleaf crops.

BASF received a label for the Provisia herbicide in the spring of 2017. The active ingredient in Provisia is quizalofop. Apply this herbicide only to Provisia rice varieties. Provisia controls red rice, weedy rice, and annual and perennial grass weeds commonly found in rice fields. The first application to Provisia rice should be applied at 13 to 18 ounces per acre. Adequate soil moisture is required for optimum herbicide activity. A second application of Provisia must be applied prior to panicle initiation. Do not apply more than 31 ounces per acre per year. Applications of Provisia to Provisia rice can cause injury, and it is usually in the form of yellow foliage often referred to as a "yellow flash." Caution should be taken to avoid spray overlap. When Provisia is mixed with other herbicides, antagonism can occur. Refer to the Provisia label for approved mixtures.

All of these new herbicides can be beneficial in Louisiana rice production. As always, use a well-designed weed control program with multiple modes of action by taking advantages of residual herbicides such as RiceOne followed by post-emergence herbicides such as Gambit, Loyant and Provisia.

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Pests of Stored Rice

Now that most of the rice is out of the field and temperatures are beginning to cool down, you may think your problems with insect pests are over for the year. However, stored grain pests remain a threat year-round. Even during winter months, grain bins can remain warm enough for insect pests to thrive if not properly aerated. From the time it is cut to the moment it is sealed in packaging, rice is vulnerable to attack from numerous stored grain pests. Management of stored grain pests is an important operation from small on-farm silos to commercial rice dryers and mills. Hundreds of different insects, including many types of beetles and moths, are known to infest stored rice around the world. The most commonly encountered pests infesting stored rice in Louisiana are the red flour beetle, the confused flour beetle, the lesser grain borer, the flat grain beetle and the rice weevil. All of these pests live and breed in stored grains, severely reducing grain quality of both rough and milled rice. As their names suggest, grain beetles are more prone to attack rough rice, while flour beetles are more common pests of milled rice.

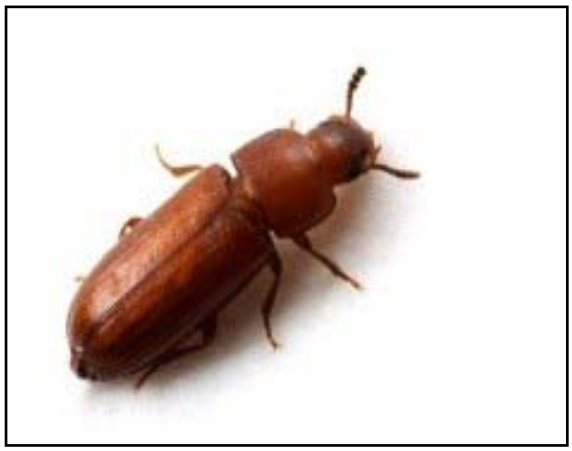
***Lesser grain borer**, Rhyzopertha dominca*

Stored rice should be monitored frequently for the presence of these pests, as heavy infestations can develop rapidly. In all species, both adults and larvae feed on stored rice. Adult beetles are typically easier to see because larvae typically feed inside individual grains. It is safe to assume that if large number of adults are observed, larvae also are present. Monitoring tools, including pheromone lures and sticky traps, can help with pest detection, but visual inspection of stored grains should be conducted regularly.

Management of stored grain pests is achieved with a combination of sanitation, aeration and chemical controls. Good sanitation and well-maintained equipment is the first line of defense against stored grain pests. Infestations often begin outside the grain bins in piles of spillage, and elimination of stray grain piles near storage facilities is key to management. Alternatively, infestations can be carried over from previously infested bins if they are not cleaned properly when emptied. However, these beetles often can find their way into even the cleanest and most well-maintained facilities. Effective aeration is critical to reducing insect infestations. High temperature and moisture greatly increase the risk of damaging infestations. Insect life cycles are generally shortest at temperatures of 75 to 90 degrees Fahrenheit, and reducing the temperature inside grain bins to levels below 60 degrees can substantially slow insect feeding and development. Temperature within bins should be closely monitored. Aeration does not always produce uniform cooling and hotspots may be present within the bins. To be effective, aeration systems should be designed to move air evenly through grain to reduce temperature variation.

***Rice weevil**, Sitophilus oryzae*

While proper sanitation and aeration can significantly reduce the need for chemical control, insecticides often are needed to suppress pest populations to acceptable levels. In the past, fumigation with methyl bromide was widely used across the U.S. to manage stored grain insects. This chemical is no longer registered, but alternatives are available. Fumigation with Phostoxin (phosphine) or Profume (sulfuryl fluoride) has now replaced the use of methyl bromide. These chemicals are highly toxic to humans and insects alike, and fumigation requires special training and equipment. Several fumigation services are available to provide these treatments on-site to rice mills and farm grain storage bins. The services often will assist in pest identification and recommend appropriate controls.



***Confused flour beetle**, Tribolium confusum*

Note: Red flour beetles look very similar, but have wide "clubs" at the end of antennae.

When done correctly, fumigation generally provides 100-percent control of all insect life stages. These treatments don't have lasting activity and do not protect grain from reoccurring infestations. Multiple fumigations throughout the year often are required. Many farmers have a low tolerance for stored grain pests and opt for periodic fumigation treatments even when pest infestations are not readily apparent. Because fumigation typically requires hiring an outside service, this may not be the most cost effective approach. Frequently monitoring grain bins for infestations and using a "treat when needed" method can reduce control costs. Alternative chemical control options include the use of aerosol spray applications of insecticides. While these treatments are effective, they are more appropriate for spot treatments and can't be used to treat entire grain bins. Always consult the product label before applying any insecticides to stored rice. Chemical controls should be used as a supplement, and cannot replace proper sanitation and aeration.

More information on stored grain pest identification is available in a comprehensive guide developed by the International Association of Operative Millers at http://www.iaom.info/content/wp-content/uploads/IPM-Manual.pdf. If you have questions regarding stored grain pests, contact your local LSU AgCenter extension agent.

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What You Need to Know if You Plan to Plant the New Provisia Rice Variety PVL01

The first Provisia rice variety will be released on a limited basis for the 2018 rice production season. The first variety, named PVL01, was developed by Dr. Steve Linscombe at the H. Rouse Caffey Rice Research Station. Provisia herbicide and PVL01 make up the Provisia rice system that will provide needed control of red rice, Newpath-resistant red rice and Newpath-resistant weedy rice. However, there are a few things you need to know prior to planting your first Provisia rice crop.

Yield potential – The yield potential for PVL01 is less than all of our commonly grown rice varieties, such as Mermentau and Cheniere. Unfortunately, ratoon yield potential is limited too. Therefore, it is recommended that PVL01 be used in fields where Newpath resistant red rice and weedy rice are problematic. You also may choose to use PVL01 in fields in rotation with the Clearfield system and soybeans to prevent outcrossing and help maintain the Clearfield and Provisia technologies. Rest assured that yield potential will improve with future Provisia varietal releases — but for now, let's use it only where we need it.

Seeding rates – Current data from seeding rate trials suggests PVL01 tends to reach its maximum yield potential in the 10- to 15-plants-per-square-foot range just like other common rice varieties (Figure 1). Therefore, you will need to plant approximately 20 to 30 seeds per square foot to make sure you achieve the desired three-leaf plant population. Based on the seed weight of PVL01, this means you need to plant 50 to 70 pounds of seed per acre (Table 1). Increased seeding rates will be needed when the seedbed is less than ideal or for dry broadcasting or water seeding.

Nitrogen – Recent variety by nitrogen trials indicate PVL01 will need approximately 30 pounds more nitrogen (N) than many of our other currently grown rice varieties (Table 2). Most rice varieties typically need 120 to 160 pounds of nitrogen per acre. However, PVL01 will need 150 to 180 pounds per acre to maximize yield potential. The exact rate depends on soil type, available soil nitrogen, nitrogen fertilizer efficiency and other factors.

Disease potential – Research by Dr. Don Groth indicates PVL01 is susceptible to blast and bacterial panicle blight and moderately susceptible to sheath blight. Disease pressure is often increased when using higher nitrogen fertilizer rates. Therefore, you should always use a fungicide when growing PVL01. If disease pressure is high early in the season, two fungicide applications may be needed.

Provisia herbicide use – Temporary physiochemical stress symptoms often can occur when using the Provisia herbicide, causing the plants to look yellow. This "yellow flash" is temporary, and rice will generally recover after a few days of good growing conditions. Research by Dr. Eric Webster also has shown antagonism can occur when tank mixing some herbicides with Provisia. See label and article by Drs. Webster and Ben McKnight for more information on herbicide use.

Light green color – The color of PVL01 is not as dark green as most of our commonly grown rice varieties and hybrids (Figure 2). The light green color of PVL01 may cause growers to be concerned that the variety is being under-fertilized with nitrogen or that the rice is constantly under stress. Just be aware that PVL01 will not turn the dark green color we see with our other varieties, regardless of how much nitrogen is applied.

Figure 1. Yield response of PVL01 to three-leaf plant population on a Crowley silt loam soil. H. Rouse Caffey Rice Research Station, 2017.

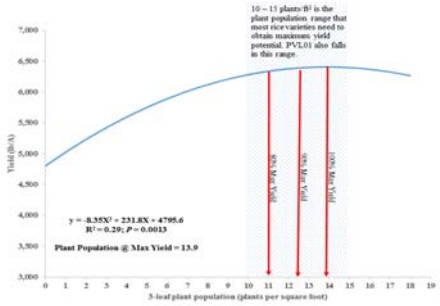

Table 1. Seed per pound and average number of seed per square foot for PVL01.

Variety	Seed/lb*	40	50	60	70	80	90	100	110	120
		seed/ft²								
PVL01	19,324	18	22	27	31	35	40	44	49	53

*Average seed weight determined from three seed lots.

Table 2. Variety by nitrogen yield trial results for three Louisiana locations in 2017.

	Vermilion Parish		Rice Research Station		St. Landry Parish	
	PVL01	CL153	PVL01	CL153	PVL01	CL153
N Rate	Yield (lb/A)					
0	3670	5678	2950	3599	3491	5242
30	4182	7129	4047	5661	4070	6046
60	5171	7649	4749	6585	4241	6452
90	6260	8200	5834	7649	4526	7004
120	6885	8312	7010	8970	4876	7148
150	7800	7889	6987	8887	4616	7324
180	7398	8278	7567	9267	5217	7483
210	7654	7946	7516	9411	5329	7505

*Boxed yield designates estimated optimum yield across N rates.

Figure 2. CL172 and PVL01 grown side by side illustrating the light green color associated with PVL01.

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Focus

Dr. Kurt Guidry

Kurt Guidry, the new director of the LSU AgCenter Southwest Region, grew up in the Acadia Parish town of Morse.

There he learned about farming from neighbors and his grandfather, Euclid Guidry, who farmed cattle, rice and soybeans. So when it came time for him to decide what he wanted to study in college, the choice was easy. "I knew I wanted to do something in agriculture."

He attended the University of Louisiana at Lafayette and graduated in 1991 with a degree in agribusiness. But he admits, the first few semesters were difficult, and he even thought about quitting until he got to his agriculture classes.

"Once I started liking school, I never wanted to leave."

He went to graduate school at LSU and earned a master's degree in agricultural economics, then he took a job as a 4-H agent in St. Landry Parish for 10 months. He decided to return to graduate school for his doctorate and he picked Oklahoma State over LSU and Texas A&M. For his Ph.D., he focused on a computer program that simulated market conditions for the meat packing industry.

After graduation with a doctorate degree in 1997, he was hired by the LSU AgCenter as an ag economist working with a variety of commodities, including rice, cattle and soybeans.

Among his responsibilities has been the compilation of data for the annual Ag Summary that tracks the annual statistics for every commodity in the state. Guidry said he will continue putting the Ag Summary together at least for the first couple of years in his new job.

Guidry said he was interested in the job of regional director because of the new challenge it presented, and because he is from the area and knows most of the county agents. "It just made sense to throw my hat in the ring."

He said he realizes he has big shoes to fill in the position previously held by Dr. Steve Linscombe. "I'm happy to fill a portion of those shoes."

Guidry said he has been impressed with the station personnel. "Everything I had heard about the staff has been more than true."

He said his goal is to maintain the success of the region and the station. "I want to look for opportunities to expand our reach."

He said he also wants to increase awareness of the quality of research coming from the station, and improve efficiency in the region while maintaining the level of service and commitment. "We can't lose sight of what built this station."

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