H. Rouse Caffey Rice Research Station News

Volume 18 Issue 2 – May 2021

1909-2021
58 released varieties

Inside This Issue:

Special Dates of Interest:

- June 8 – Southwest Rice Field Day, Iowa, LA
- June 16 - Acadia Parish and South Farm Field Day, Crowley, LA
- June 30 – H. Rouse Caffey Rice Research Station Annual Field Day, Crowley, LA
- July 15 – Row Rice Field Day, Northeast Research Station, St. Joseph, LA

Contact Information:

Dr. Dustin Harrell
Resident Coordinator
H. Rouse Caffey
Rice Research Station
1373 Caffey Road
Rayne, LA 70578
Phone: (337) 788-7531
Fax: (337) 788-7553
https://www.lsuagcenter.com/portals/our_offices/research_stations/rice

It's Been Finalized!

The Rice Research Station Field Day will be **LIVE and in person** June 30, 2021

Early Season Challenges for the Louisiana Rice Crop

Every year is unique when it comes to the challenges that we face in a rice growing season and 2021 is no exception. The first few weeks of March were somewhat normal, and we were able to plant a significant amount of rice in southwest Louisiana in a short amount of time. The last week of March and the whole month of April were much more challenging. The weather across the state during that time was either wet, overcast with little sunshine, cold, or a combination of the above. These conditions have caused a plethora of problems with the rice crop, and I would like to cover the most commonly asked questions we received and their respective recommendations.

The most common problem with the poor growing conditions this year is stressed rice that is not growing and looks sick. This can be caused by many things. One common cause is stress from a recent herbicide application. While many herbicides are labeled and safe to apply in a rice crop, they can still cause a significant amount of stress to the rice until the it can metabolize the herbicide. This can happen very quickly in good growing conditions but can be very slow in wet, overcast, and cold weather. The remedy for this is simply warm weather and sunshine. If there is water on the field, this can sometimes make the herbicides hotter, and draining will help the rice recover.

A second condition this year is cold-induced zinc deficiency. This often occurs early in the season when the rice plant does not have a developed root system and is unable to take up zinc in the soil. This can often be difficult to identify on very young rice, but as it gets older, it can be identified by the reddish splotches on the leaf often referred to as bronzing. In this case, many growers elect to apply a foliar zinc herbicide to the crop. Zinc soil applications are also beneficial; however, until the rice plant is actively growing again, and the root system is larger, the rice plant will have some difficulty getting the zinc needed. If water is standing on the field, it will need to be drained to help the rice recover.

Continued on page 2.

Louisiana State University Agricultural Center, Louisiana Agricultural Experiment Station, Louisiana Cooperative Extension Service, and Louisiana State University College of Agriculture.
The LSU AgCenter is a statewide campus of the LSU System and provides equal opportunities in programs and employment.
This project was partially supported by USDA National Institute of Food and Agriculture and the Louisiana Rice Research Board.

During the less-than-ideal growing conditions that we have had thus far, there has been a lot of rice that has reached tillering and needs to be fertilized with nitrogen. The most common question regarding this is if nitrogen should be applied or delayed until better growing conditions? The answer depends on each individual situation. In the case of drill-seeded rice, if the application of urea can be applied on dry ground and flooded quickly, it is ok to apply the nitrogen. In this scenario, the nitrogen will be safely stabilized in the anerobic (no oxygen) flooded soil conditions and the rice can take it up at its leisure when it begins growing again. In water-seeded rice where nitrogen will have to be applied into standing water, it may be best to wait for better growing conditions. In this scenario, nitrogen can be lost very quickly due to various loss mechanisms. When nitrogen fertilizer must be dropped into standing water, you will want to wait until better growing conditions (warmer weather and sunshine) so that more of the applied nitrogen can be taken up by the rice plant before it is lost. In a situation where water-seeded rice is well into tillering or has signs of nitrogen deficiency, it is probably best to go ahead and apply that nitrogen knowing that you will most likely have to apply more nitrogen later to make up for the lost nitrogen. Nitrogen deficient rice can be identified by the chlorosis (yellowing) of the older leaves first. Nitrogen deficiency symptoms are often accompanied by small circular reddish-brown spots (brownspot disease). Brownspot, caused by the fungus *Cochiobolus miyabeanus*, can be triggered by several plant stresses, but nitrogen deficiency is the most common stress associated with the disease. This is also the most common fungus that causes seedling blight. We have seen a tremendous amount of seedling blight early on this season.

Another field issue we have seen this year is the early appearance of the South American rice miner. This pest feeds on new leaves in the whorl of the plant. As new leaves emerge you can see where the pest has fed, and this causes the field to have a ragged look. Unfortunately, an insecticide is ineffective for the pest since it is protected in the whorl. Like most of our other issues we have seen thus far this year, the rice will eventually outgrow the damage once we have better growing conditions.

Figure 1. Seedling blight in rice.

Figure 2. Brown spot disease on rice. Brownspot is caused by the fungus Cochiobolus miyabeanus and is associated with plant stress and nitrogen deficiency.

Continued on page 3.

Figure 3. Typical South American rice miner damage in rice.

Figure 4. Application of urea fertilizer.

Dr. Dustin Harrell
dharrell@agcenter.lsu.edu

The Effect of Cultural Management Practices on Greenhouse Gas Emissions in Rice Production

Methane (CH_4) and nitrous oxide (N_2O) are both considered greenhouse gases which can be lost from agricultural fields. In general, flooded agricultural fields display a higher methane loss while upland fields display a higher nitrous oxide loss. New rice cultural management practices such as furrow irrigated rice (row rice) and alternate wetting and drying (AWD) may result in less methane with more nitrous oxide emissions, since they are not flooded as long as traditional rice production. However, more research is needed to evaluate the overall Global Warming Potential from these systems as compared to traditionally produced rice.

A 3-year research study funded by the Louisiana Rice Research Board was conducted from 2018-2020 to evaluate methane and nitrous oxide emissions from different cultural management practices. The three cultural practices evaluated were conventional delayed flood, AWD, and row rice. Phosphorus and potassium fertilizers were applied at planting at the rate of 67 kg P_2O_5 and K_2O /ha. Nitrogen (N) was applied pre-flood at a rate of 168 kg N/ha one day before permanent flood establishment or the initial irrigation event in the case of row rice. Greenhouse gas samples were collected twice a week when the field was flooded until rice was harvested from static chambers installed in each cultural practice. Gas samples were analyzed for methane and nitrous oxide using gas chromatography.

Methane emissions from the three cultural management practices are shown in Figure 1. The highest methane emissions were detected in delayed-flood rice and ranged from 90 to 127 kilograms of methane per hectare per season (kg CH_4/ha/season)*. The lowest methane emissions were from the row rice system which ranged from 20 to 22 kg CH_4/ha/season. The methane emissions in AWD ranged from 21-36 kg CH_4/ha/season. The differences in methane emissions were highly related to flooding duration.

Nitrous oxide emissions were highest in row rice system (Fig. 2) which ranged from 1,989 to 2,826 grams of nitrous oxide per hectare per season (g N_2O /ha/season). The lowest nitrous oxide emissions were observed in the delayed flood system which ranged from 111 to 297 g N_2O /ha/season. The nitrous oxide emissions from AWD ranged from 206 to 1,439 g N_2O /ha/season.

Even though higher emission rates of nitrous oxide were observed in row rice, the total Global Warming

Continued on page 4.

Potential from this practice was lower than the delayed flood system (Fig. 3). The Global Warming Potential was calculated in mass of CO_2 equivalent over a 100-year time horizon. The radioactive potentials relative to CO_2 of 28 and 265 were used for CH_4 and N_2O, respectively (IPCC, 2013).

Results from this research suggests that the reduced flood time in both row rice and AWD reduces the Global Warming Potential impact compared to traditional flooded rice production.

* Note: 1 kilogram is 2.2 pounds, 454 grams per pound and a hectare is approximately 2.5 acres.

Figure 1. Methane emissions (kg/ha/season) from conventional delayed flood, alternate wetting and drying (AWD), and furrow irrigation (row rice) cultural management practices. H. Rouse Caffey Rice Research Station, Crowley, Louisiana, 2018-2020.

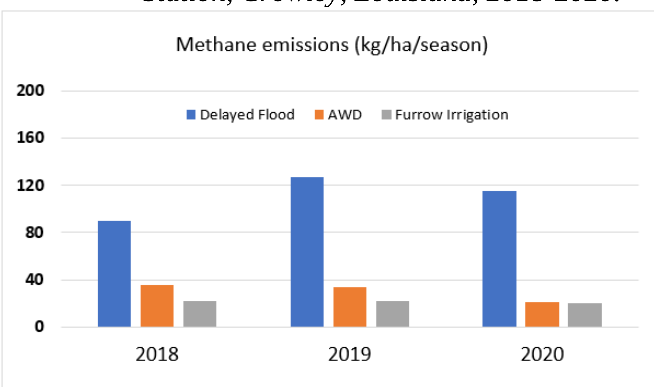


Figure 2. Nitrous oxide emissions (g/ha/season) from conventional delayed flood, alternate wetting and drying (AWD), and furrow irrigation (row rice) cultural management practices. H Rouse Caffey Rice Research Station, Crowley, Louisiana, 2018-2020.

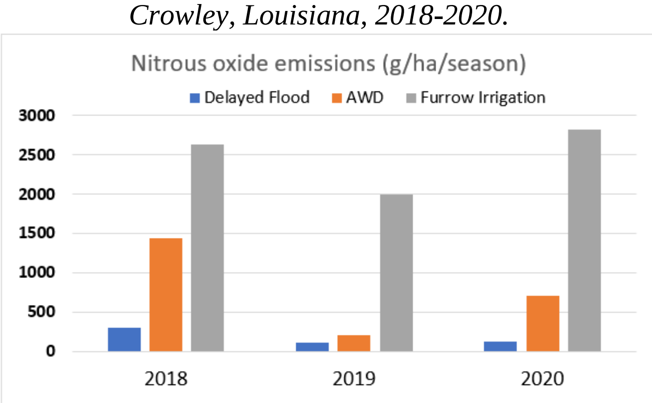
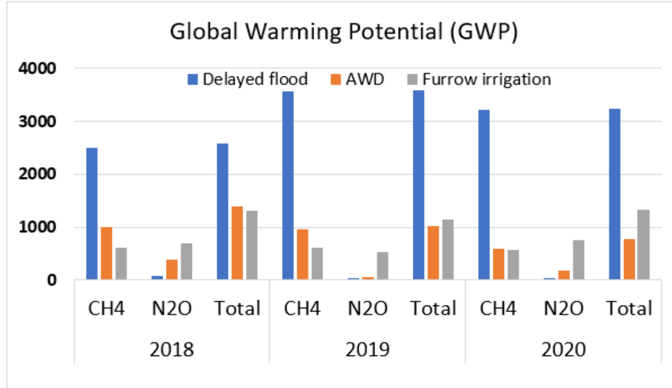
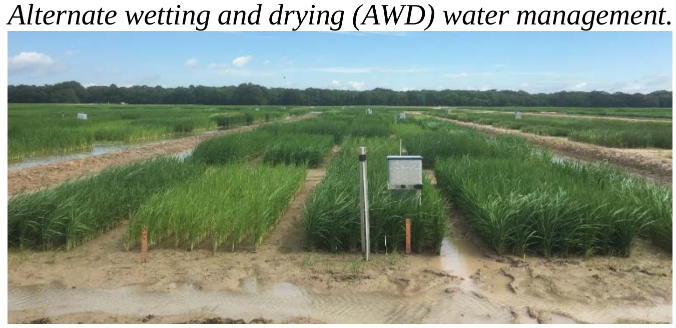


Figure 3. Global Warming Potential (kg CO2 eq/ha) from conventional delayed flood, alternate wetting and drying (AWD), and furrow irrigation (row rice) cultural management practices. H. Rouse Caffey Rice Research Station, Crowley, Louisiana, 2018-2020.



Conventional delayed flooding.

Alternate wetting and drying (AWD) water management.



Furrow irrigation or row rice water management.

Dr. Manoch Kongchum
mkongchum@agcenter.lsu.edu

Pest Concerns for Late-Planted Rice

The recommended planting dates for Louisiana rice are March 10–April 15 for southwest regions and April 1–May 5 in the north. In an ideal world, all rice would be planted within those windows to maximize yield potential. In the real world, weather delays, equipment failures, labor shortages, or other factors can prevent timely planting. Some farmers may opt to plant fields following crawfish production, pushing planting to well outside the optimum window. Yield is often reduced in late-planted rice by the stress from high summer temperatures. Insect pests and diseases are often worse in late-planted fields. Here are some considerations on how to approach insect management if you're behind in getting the crop in.

Contrary to prior beliefs, recent evidence suggests rice water weevil infestations do not vary greatly among planting dates. High infestations can occur even in fields planted the first week of March, suggesting spring emergence of adult weevils may now be occurring earlier than in the past. Farmers should plan on controlling this damaging pest in all fields. Conversely, extremely late-planted rice, such as fields planted for fall crawfish forage, tends to have reduced weevil damage as adults begin to move into over-wintering habitats. However, this is the exception, not the rule. Most insect populations continue building as summer approaches, increasing the likelihood that damaging infestations will occur.

Stem borers, particularly the Mexican rice borer, are much more problematic in late-planted rice in comparison to rice that is planted on time. Densities of blank panicles, or whiteheads (Figure 1), are three to four times greater in rice planted in late-April or May. Yield loss from borers alone in late-planted fields may reach 10–15%, with potential for greater losses under severe infestations. Farmers should plant seeds treated with Dermacor X-100 or plan on scouting untreated rice for borer larvae from tillering to grain-fill. Scout for borers by removing leaf sheaths and looking for the presence of larvae. No thresholds have been developed for stem borers, but if you're finding larvae, you should consider a foliar application of a pyrethroid. Once whiteheads appear, it's too late to achieve control. The damage is already done.

Armyworms, the other key Lepidopteran (caterpillar) pest, are also worse in late-planted rice. Defoliation of young rice can be severe in some cases, but rice can often grow through low to moderate levels of injury with minimal impacts to yield. Armyworm infestations tend to decline once the permanent flood is established, as larvae drown or become exposed to natural enemies. As with stem borers, armyworm infestations can be controlled with Dermacor X-100 seed treatment or foliar pyrethroid applications. In both cases, pyrethroid applications should not be made to rice in a crawfish rotation.

Rice stink bugs are more mobile than Lepidoptera larvae and may become concentrated in fields that are in reproductive stages if no other headed rice is in the area. This may occur if a field is either the first to head in a given area, or the last. Regardless of planting date, rice should be sampled with a sweep-net from flowering to hard dough to guide treatment decisions.

Other, less-damaging pests are also worse in late-planted fields. The rice leaf miner and South American rice miner often injure young rice in late-planted fields. As with armyworms, rice tends to recover in most cases. Effective control strategies for these pests have not been identified, so most infestations should be left untreated. Maintaining plant health through effective timing of fertilization, and weed and disease control, should allow rice to grow out of this injury without much impact on yield. More sporadic pests, including aphids and chinch bugs, can also reach damaging levels in late-planted fields. If concerning infestations of these or other insects develop, contact an extension agent to help assess the situation before making treatment decisions. Information on the full spectrum of rice insects is available on the LSU AgCenter website or in the Rice Varieties and Management Tips booklet.

Figure 1. Whiteheads.

Dr. Blake Wilson
bwilson@agcenter.lsu.edu

Hybrid Rice Research Program Update

Hybrid rice continues to serve as a viable option for Louisiana rice producers. Nearly one-third of the total Louisiana rice acres in 2020 were planted with hybrid varieties. New Clearfield experimental hybrids CLH134 and CLH103 showed high yield potential comparable to commercial hybrids in the 2020 Hybrid Multi-Location Yield Trials (Fig. 1). CLH134 produced 15 to 32% higher grain yields versus Clearfield varieties CLL17, CL153, CL151 and CL111. CLH134 also generated 14% higher grain yields compared to conventional hybrid LAH169. Excellent whole-grain milling yields were observed for CLH134. Hybrid CLH103 produced grain yields virtually identical to commercial hybrid CLXL745, an 11% yield advantage versus LAH169, and excellent milling yields. Both CLH134 and CLH103 exhibited early maturity at 77 to 79 days. Additional yield trials for CLH134 and CLH103 will be conducted in 2021.

A new Provisia hybrid, PVH148, showed high yield potential compared to commercial hybrids in the 2020 Hybrid Preliminary Yield Trial at the South Farm location. PVH148 produced 34 and 24% higher yields versus Provisia variety PVL02 and LAH169, respectively. Another new Provisia hybrid, PVH149, produced nearly identical yields to commercial hybrid XP753 and a 20% yield advantage over LAH169.

A new and efficient method for rapid advancement of breeding material in the greenhouse has been developed in cooperation with Dr. Adam Famoso. This method uses a synthetic soil mix for year-round availability that reduces costs in labor and equipment. Growth of plants in small containers allows high capacity where nearly 3,000 individual plants can be grown over a generation time of 3.2 months in a small footprint of 8 ft x 4 ft (Fig. 2). The new method is expected to complement or replace the traditional evaluation of early-generation breeding material in the field to reduce time for new varietal development.

Figure 1. Clearfield experimental hybrids CLH134 (left) and CLH103 (right) evaluated in the 2020 Hybrid Multi-Location Yield Trials, H. Rouse Caffey Rice Research Station.

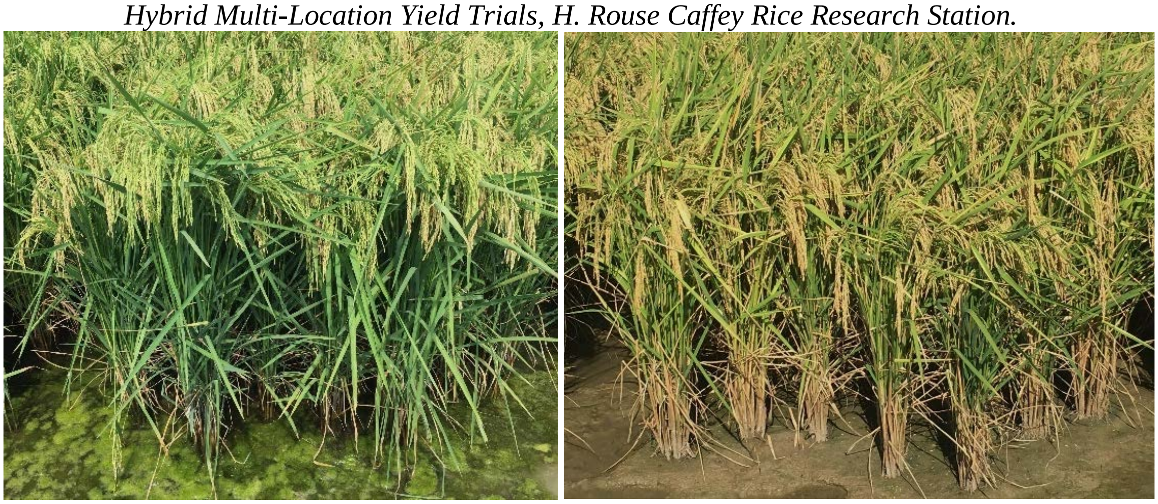


Figure. 2. Rapid advancement of breeding material at high capacity in the greenhouse.

Dr. James Oard
joard@agcenter.lsu.edu

Charles and Rose Broussard Internship Program scholarship recipient to intern will begin in May at the Rice Research Station

Hunter Lepretre, a junior at McNeese State University, has been chosen as the first student selected for a research internship with the LSU AgCenter through an endowment established by the family of Charles and Rose Broussard.

Lepretre will begin the paid internship in May at the H. Rouse Caffey Rice Research Station, working in the agronomy research project under Dustin Harrell, LSU AgCenter agronomist and resident coordinator of the Rice Research Station.

A 2019 graduate of Gueydan High School, Lepretre is majoring in natural resources conservation management and general agriculture. With an interest in forages, but open to multiple career possibilities, he believes the internship will allow him to learn more about research in general.

"This gives me a chance to see everything that's going on," Lepretre said.

Lepretre developed a strong agricultural background while growing up on a cattle farm in Vermilion Parish, where he showed pigs and cattle in 4-H. He was chosen as Vermilion Parish Premier Exhibitor three times, has worked on farms and ranches and has participated in several wildlife research projects.

Kurt Guidry, director of the LSU AgCenter Southwest Region, said student workers are hired at the Rice Research Station every summer to help with research projects. He credited the Broussard children for their commitment to carrying on their parents' legacy in making the internship viable.

"I think this is going to be a step up from a typical student worker job," Guidry said. "And it wouldn't be possible without the general support the Broussard's have given to the program."

Charles and Rose Broussard owned the Flying J Ranch in Vermilion Parish with a large cattle and rice farm. They were both active in numerous agricultural and civic organizations with a lifelong commitment to 4-H.

The four Broussard children believe the internship will help carry on the legacy of their parents' commitment to agriculture and education.

"It's a wonderful memory of our parents, and encourages future generations to participate in what our parents did," Richard Broussard said.

Broussard's sister, Yvonne Broussard Simon, a 4-H leader in Vermilion Parish, echoed his sentiments on the internship program's lasting effects. "It motivates our youth to keep going in agriculture," Broussard Simon said.

Their siblings, Alan and Hal Broussard, see the internship as a continuation of the Broussard legacy.

"This was inspired by knowing our parents' history in agriculture," Alan said.

Hal added, "Supporting agriculture was their life."

Bruce Schultz
bschultz@agcenter.lsu.edu

Focus

Matthew Breaux

Matthew Breaux has been working as a research farm assistant for the agronomy project since February. Before this job, he had been a student worker at the Rice Research Station starting in 2017.

Matthew said his job includes a wide range of work, from pulling off types in the research plots to spraying fields and preparing fertilizer. In the lab, Matthew works with a soil volatility project. “I do a little bit of everything.”

“I like being outside and working with the science behind the experiments, and seeing the growth of the plants,” he said.

He works with Manoch Kongchum, LSU AgCenter agronomist.

“Matthew has been trained to assist in both field and laboratory research for several projects in the agronomy program,” Kongchum said.

He said Matthew works on a research project funded by the Louisiana Rice Research Board for the study of greenhouse gas emissions from rice fields. “The work is very labor intensive. Matthew assists in collecting greenhouse gas samples in the rice field and analyzing greenhouse gas samples using a gas chromatograph. His help is critical to maintain the current workload in this project.”

Matthew graduated from Crowley High School in 2018. He attended LSU at Eunice for a couple of semesters.

Matthew’s father, Paul Breaux, was a rice farmer near Egan.

When he’s not working, Matthew helps take care of the family home in Crowley.

Bruce Schultz
bschultz@agcenter.lsu.edu

Like us on Facebook

The LSU AgCenter H. Rouse Caffey Rice Research Station is on Facebook. The page provides timely updates on research conducted at the station as well as other useful information. The page can be accessed at the link below. Simply go to the page and click on LIKE. Updates will then be posted to your Facebook newsfeed. If you are not currently a user of Facebook, signing up is easy and free. https://www.facebook.com/LSU-AgCenter-H-Rouse-Caffey-Rice-Research-Station-212812622077680/

LSU AgCenter Research · Extension · Teaching

Online Store

Visit the LSU AgCenter online store at the following website to purchase our publications or view free ones. https://store.lsuagcenter.com/default.aspx

This newsletter is produced by Valerie Dartez, Bruce Schultz, Dustin Harrell, Darlene Regan, and Roxanne Trahan.