MISSISSIPPI RICE

VARIETY TRIALS, 2021

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MISSISSIPPI'S OFFICIAL VARIETY TRIALS

MISSISSIPPI STATE UNIVERSITY™
MS AGRICULTURAL AND
FORESTRY EXPERIMENT STATION

Mississippi Rice Variety Trials, 2021

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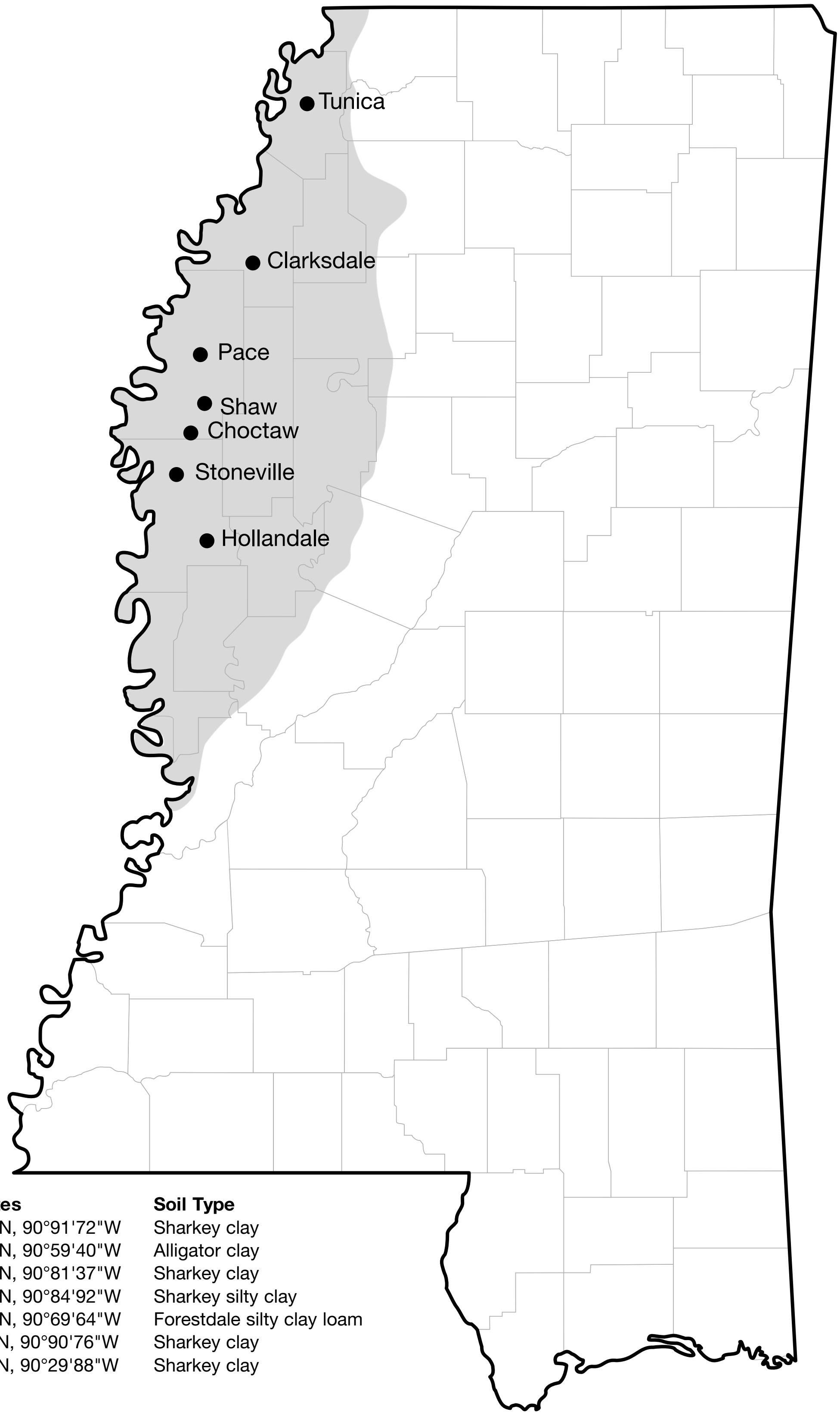
Find variety trial information online at ***mafes.msstate.edu/variety-trials***.



Location	Coordinates	Soil Type
Choctaw	33°60'07"N, 90°91'72"W	Sharkey clay
Clarksdale	34°03'47"N, 90°59'40"W	Alligator clay
Hollandale	33°16'68"N, 90°81'37"W	Sharkey clay
Pace	33°79'25"N, 90°84'92"W	Sharkey silty clay
Shaw	34°76'54"N, 90°69'64"W	Forestdale silty clay loam
Stoneville	33°43'14"N, 90°90'76"W	Sharkey clay
Tunica	34°57'56"N, 90°29'88"W	Sharkey clay

Figure 1. Locations of the 2021 Rice On-Farm Variety Trials in the Mississippi Delta.

Mississippi Rice Variety Trials, 2021

INTRODUCTION

The United States Department of Agriculture (USDA) National Agricultural Statistics Service (NASS) estimated the 2021 harvested rice area in Mississippi based on reports from rice producers to be about 101,000 acres. The USDA Farm Service Agency (FSA), on the other hand, certified the 2021 rice planted area in the state to be 100,862 acres. This FSA estimate is the lowest reported acreage for rice in Mississippi since 1973 (last 48 years). It is 70,000 acres or 40% less than rice acres in 2020 and 47,300 acres (32%) less than the running 10-year rice acreage in Mississippi of 148,300 (2011–2020) (Table 1).

The USDA-NASS in December 2021 also reported the total rice production for Mississippi to be 7.474 million hundredweight or 379,696 metric tons, down 39% from the 2020 production of 12.241 million hundredweight or 621,871 metric tons. At the USDA Economic Research Service December 2021 estimate of the average U.S. rice farm price of $13.10 per hundredweight, the value of Mississippi rice production for 2021 is $97.9 million. Rice yield was reported by USDA NASS to be 7,400 pounds per acre (164.4 bushels per acre), down 20 pounds from 2020 but 137 pounds more than the running 10-year Mississippi average yield of 7,263 pounds (161.4 bushels per acre). The record for statewide average yield, first set in 2014, remains at 7,420 pounds per acre (164.9 bushels per acre or 8,318 kilograms per hectare).

Table 1. USDA National Agricultural Statistics survey of harvested rice acreage in Mississippi (nearest thousand) by year, 1949–2021.

Year	Acres	Year	Acres	Year	Acres	Year	Acres
1949	5,000	1969	60,000	1989	235,000	2009	243,000
1950	7,000	1970	51,000	1990	250,000	2010	303,000
1951	26,000	1971	51,000	1991	220,000	2011	157,000
1952	40,000	1972	51,000	1992	275,000	2012	129,000
1953	51,000	1973	62,000	1993	245,000	2013	124,000
1954	77,000	1974	108,000	1994	313,000	2014	190,000
1955	52,000	1975	171,000	1995	288,000	2015	149,000
1956	44,000	1976	144,000	1996	208,000	2016	194,000
1957	31,000	1977	111,000	1997	238,000	2017	118,000
1958	39,000	1978	215,000	1998	268,000	2018	135,000
1959	44,000	1979	207,000	1999	323,000	2019	116,000
1960	44,000	1980	240,000	2000	218,000	2021	171,000
1961	44,000	1981	337,000	2001	253,000	2021	101,000
1962	49,000	1982	245,000	2002	253,000	2022	—
1963	49,000	1983	161,000	2003	234,000	2023	—
1964	49,000	1984	190,000	2004	234,000	2024	—
1965	50,000	1985	188,000	2005	263,000	2025	—
1966	55,000	1986	198,000	2006	189,000	2026	—
1967	55,000	1987	198,000	2007	189,000	2027	—
1968	67,000	1988	260,000	2008	229,000	2028	—

Fifteen counties produced rice in Mississippi during 2021 as certified by the USDA-FSA (Table 2). The top rice-producing counties in 2021 were Bolivar, Tunica, Sunflower, Washington, and Coahoma with 28,131, 22,128, 10,816, 8,272, and 7,115 acres planted, respectively. Only two counties planted more than 10,000 acres of rice in 2021, compared to eight counties in 2020. Bolivar and Tunica Counties have been the top two rice-producing counties for Mississippi for 10 years running (2012–2021). Practically all the top-10 counties with significant rice acreage registered a net loss in acreage in 2021 compared to 2020, with the highest acre reductions of 14,976, 9,204, and 8,468 occurring in Bolivar, Quitman, and Sunflower Counties, respectively.

Rice planting was earlier in Mississippi in 2021 compared to recent years, aided by the favorable weather conditions in March and early April. A few hundred acres were planted as early as late March, and well over half of state rice acreage was already planted by the third week of April, compared to less than 60% planted rice area by middle of May in the preceding 2 years. Historically, almost 90% of the rice in Mississippi is planted by the third week of May, and in 2021 most of the rice crop was planted by the middle of May.

The rice crop, however, was badly affected by continuous rain during the first 2 weeks of June. A large swathe of the central Mississippi Delta, which planted some of the largest rice acres in the state, received as much as 25 inches of rain during this period, with some counties getting most of this heavy rainfall within only a 24-hour window. Consequently, thousands of rice acres were destroyed or significantly damaged due the rice crop, at various growth stages, being submerged in water for multiple days up to 2 weeks or even longer. Luckily, rice in some flooded areas was salvaged, and rice planted in the northern and southern regions of the Mississippi Delta was spared from flooding resulting in favorable harvests.

Among the few production issues reported in 2021 were high temperatures in late July and early August when early-planted rice was already flowering, insects such as stink bugs and armyworms, and diseases such as kernel smut, mold, and sheath blight late in the season. However, for the most part, severe disease and insect pest pressures were observed only in a few isolated areas. Glyphosate drift, however, continued to be a grave concern, with some fields suffering major damage. Also, areas affected by the June flood event had a prolonged harvesting period—often with the bottom half of their fields that suffered the most submergence stress resulting in delayed maturity by up to 10 days. Most of the Mississippi rice production in 2021, however, was harvested by the end of September.

Table 2. USDA Farm Service Agency certified rice acres planted by county in Mississippi, 2012–2021.

County	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	10-yr. avg.
Adams	192	0	0	0	157	0	157	0	0	0	51
Attala	0	0	0	0	0	0	0	0	0	0	0
Bolivar	34,956	33,734	47,702	42,139	47,839	27,431	34,659	32,338	43,107	28,131	37,204
Carroll	0	0	0	0	0	0	0	0	102	0	10
Coahoma	8,797	8,109	14,453	9,933	12,885	7,788	9,970	5,768	10,248	7,115	9,507
DeSoto	553	1,190	2,316	99	1,896	1,261	1,605	586	1,009	585	1,110
Grenada	282	282	0	893	402	143	0	55	278	197	253
Holmes	141	121	203	195	655	0	1,036	126	207	0	268
Humphreys	1,955	1,475	3,426	2,576	5,695	3,874	4,264	4,089	6,242	2,478	3,607
Issaquena	890	1,115	483	345	764	427	435	0	0	100	456
Lee	10	3	3	0	3	0	0	0	0	0	2
Leflore	5,328	3,905	6,000	5,059	7,734	1,770	5,035	3,150	10,050	4,040	5,207
Panola	5,901	5,523	10,188	5,966	9,668	8,458	7,343	7,411	9,040	5,147	7,465
Quitman	8,440	8,766	15,565	12,220	20,515	10,763	10,311	10,248	15,056	5,852	11,774
Sharkey	306	433	857	789	1,123	282	647	0	202	186	482
Sunflower	14,253	13,635	25,241	15,612	19,944	7,843	12,458	9,854	19,284	10,816	14,894
Tallahatchie	6,460	6,964	12,859	7,142	12,330	7,083	6,803	7,890	10,361	6,133	8,402
Tate	828	934	1,082	955	1,123	822	797	935	1,220	682	938
Tunica	21,696	24,603	28,608	25,833	34,812	27,286	31,403	24,090	25,938	22,128	26,640
Washington	14,687	11,480	15,690	13,027	12,135	8,442	8,091	8,319	11,775	8,272	11,192
Yazoo	765	0	867	914	1,571	893	0	64	567	0	564
Total	126,440	122,272	185,543	143,697	191,251	114,565	135,014	114,923	164,686	101,862	144,266

ON-FARM VARIETY TRIALS

On-farm varietal evaluation is a vital step in the variety development process for many crops including rice. Conducting variety trials under producers' field conditions helps identify the released varieties or hybrids as well as elite experimental breeding lines that are best suited to specific growing environments, including niche markets. It also helps determine which specific entries are widely adapted to and/or have consistent performance across varying growing conditions. This information not only helps in future breeding but also is important for proper deployment of released varieties.

It is typical in on-farm variety trials for standard varieties, hybrids, new releases, and elite experimental lines to be evaluated in their target growing environments. In the case of elite breeding lines, based on their performance in these multi-environment tests, the most promising are selected for possible release as new varieties. The information collected on these lines include yield and milling performance, insect and disease susceptibility, tolerance to environmental stresses, vigor, and lodging scores. However, apart from using the data generated for line advancement decisions, they could also be used to recycle yet-imperfect lines back into the hybridization program.

With the inclusion of released varieties from Mississippi and the Midsouth as entries in the on-farm trials, the testing process also helps local rice producers to determine the most suitable released variety to plant on their respective farms based on the test locations. By placing these trials at multiple key locations throughout the Mississippi Delta, varieties, hybrids, and elite lines are exposed to the prevalent growing conditions and practices that are commonly used in commercial production in Mississippi. Many of these growing conditions and management practices cannot be reproduced at the Mississippi State University Delta Research and Extension Center in Stoneville, thus there is a great value to on-farm evaluations from a research and development perspective. In return, growers are afforded the opportunity to evaluate the current varieties and hybrids in commercial circulation, side-by-side under their own management conditions. Ultimately, this process helps them in deciding which variety or hybrid to use on their farms the following year and in placing advanced seed orders for their chosen varieties or hybrids accordingly.

Variety selection is one of the most important decisions a grower makes in crop production planning. Growers should attempt to select varieties that offer the best combination of yield and quality factors while also considering the variety's tolerance or susceptibility to both biological and environmental factors that could limit yield potential. As grain quality is becoming more important for improving U.S. rice global competitiveness, producers will benefit from having grain quality data for the commercial varieties evaluated in the variety trials. Millers, consolidators, and traders may also use this grain quality data for implementing strategies related to "identity preserved," which are gaining importance for improving overall rice grain quality. Rice research and extension specialists can use variety trials as an educational platform for demonstrating the merits of on-farm evaluation to other scientific or technical staff, growers, private consultants, rice industry personnel, students, policy makers, and the general public. Through these trials, interested parties are afforded a "first look" at new or potential releases from Mississippi State University and other participating rice-breeding programs, including from the private industry.

TEST PROCEDURES

For 2021, the rice On-Farm Variety Trials consisted of 34 entries, including five hybrids/FullPage® herbicide technology-based materials, 16 Clearfield® or Provisia® purelines (seven released varieties and nine elite experimental lines), and 13 conventional purelines (four released varieties and nine elite experimental lines). All hybrids/Full Page® materials were provided by RiceTec. HorizonAg provided all the Clearfield® and Provisia® herbicide technology-based purelines. The conventional pureline released varieties came from the public breeding programs of Mississippi (two), Arkansas (one), and Louisiana (one). The trials were conducted in seven locations from north to south of the Mississippi Delta: Tunica, Clarksdale, Pace, Shaw, Choctaw, Stoneville, and Hollandale (**Figure 1**). Individual plots consisted of eight drilled rows that were 15 feet in length and spaced 8 inches apart. Varieties and experimental lines were planted at a seeding rate of 85 pounds of seed per acre, while the hybrids were planted at 25 pounds of seed per acre. Seeds were mechanically drilled approximately 1.25 inches deep into stale seedbeds at all locations. All entries were replicated three times at each location using a randomized complete block experimental design. Crop management practices for each location, as well as the stresses encountered, are presented in **Tables 3–9.** [For more information on pesticide formulations and application rates, please refer to the pesticide product label information available on the internet or to MSU Extension Service Publication 1532, *Weed Control Guidelines for Mississippi*, which is available in print and online at http://msucares.com/pubs/ publications/p1532.pdf.

Agronomic and crop phenology data were collected at appropriate times during the growing season. Lodging ratings were obtained on a plot-by-plot basis. The entire plot was harvested with a Wintersteiger Delta plot combine equipped with a computerized weighing system and a moisture meter. Due to differences in maturity, most of the entries at each location were required to have achieved the appropriate harvest moisture level prior to the test being harvested. Average harvest grain moisture levels for each entry are reported in **Tables 3–9**. Subsamples of each entry were collected at harvest, and these were used for measuring milling-related traits, chalkiness, bushel weight, and 1,000-seed weight parameters. *For yield, previous replicated research has shown that the border effect common in small-plot research could result in increases in grain yield estimates of 10% for inbred varieties and 15% for hybrids. Therefore, the plot yields reported for the test entries should be compared in a relative manner rather than just through the absolute values for the reported yield potential.*

Analysis of variance procedure was conducted for all relevant data gathered from the trials using SAS version 9.4 statistical software. The Least Significant Difference (LSD) test at the 5% significance level may be used to determine significant differences between entries. If the value of the yield difference between any two trial entries at a location, as computed from the yields reported in **Tables 3–9,** is greater than the LSD value for that particular location, the entries are deemed to be statistically different from each other. In addition, a coefficient of variation (CV) was calculated for each test. This measure is an indication of the variability or “noise” in the trial, thus the level of precision of each test. Lower CV values indicate greater reliability of the test. Coefficient of variation values of 10% or less are generally considered to be optimum for plant breeding trials and CV values above 25% are considered unacceptable. The LSD and CV values for yield in these tests are reported in the footnotes of **Tables 3–9** and are included for the other measured variables in **Table 11**.

RESULTS

To assist Mississippi rice producers in their variety selection process for 2022, preliminary results of the 2021 rice variety trials were immediately processed and made available online by September 30, 2021, via the Mississippi Agricultural and Forestry Experiment Station or MAFES Variety Trials website (http://mafes.msstate.edu/variety-trials/includes/crops/rice.asp).

Complete details on the performance of each entry at each of the seven test locations are presented in **Tables 3–9**. As a result of the favorable early-season weather in 2021, the yield evaluations were planted in a narrow window of only about 3 weeks (April 5 to April 28) compared to the 4-week planting windows for the 2019 and 2020 trials. The Stoneville trial was the last to be planted and was the only trial conducted on an experiment station. In general, plant stands were excellent, with uniform emergence and optimum plant density for all the locations. Among the diseases reported to have occurred at some point in the growing season were leaf blast and sheath blight. However, none of these factors occurred to a level that was economically damaging or that completely wiped out any test entry. Lodging was reported in some entries in five of the seven locations (Stoneville, Shaw, Pace, and Clarksdale) but was particularly serious in Hollandale where only 10 of the 34 entries exhibited zero lodging. Of these, eight were experimental breeding lines including five Clearfield® and three conventional types, and two were commercial varieties, CL153 and Rex.

The average rice yield across entries and locations for the 2021 trials was 245 bushels per acre, down 14 bushels (or 5%) from the 2020 average of 259 bushels, but still 17 bushels (or 7%) more than the 228-bushel running 5-year variety trial overall yield average (2016–2020). In fact, the 2021 average yield is the second highest ever obtained for these trials, topped only by the 259 bushels per acre average yield obtained in 2020.

Location yield averages ranged from 215 bushels per acre for Choctaw to 277 bushels for Clarksdale. Shaw (267 bushels) and Hollandale (263 bushels) were the second and third highest-yielding sites, respectively. Choctaw was the highest-yielding location in these trials the previous year. For the second year running, the Stoneville location again had good yields, due to minimal black bird damage, unlike in past years when it had average yields that were consistently below 200 bushels per acre.

The coefficient of variation or CV values for yield were all acceptable and ranged from 5.8% for Choctaw to 11.6% for Tunica. The grain yield summary data for all entries at each location are provided in **Table 10.** Moreover, summary data for all other measured parameters averaged over the seven locations are provided in **Table 11**.

Among hybrid/FullPage® entries, two non-herbicide-tolerant entries—RT7521 and RT7401—each gave the highest yield of 292 bushels per acre, which was also the highest average yield among all entries in the trial. An herbicide-tolerant FullPage® entry came in as a very close second highest yielder with 291 bushels per acre followed closely by RT7421 (289 bushels), a non-herbicide-tolerant entry. All these four entries were included for the first time in these trials. The conventional hybrid XP753, a regular entry in this group that was not tested in 2021, had been the highest-yielding hybrid in these trials in 6 of the last 8 years with an average yield across locations of 297 bushels per acre in 2018, 296 bushels in 2017, 274 bushels in 2016, 275 bushels in 2015, 306 bushels in 2014, and 278 bushels in 2013—an average yield of 284 bushels per acre for this entire 7-year period. Its yield superiority over other hybrids and conventional pureline entries has been consistent over the years. Historically, hybrids have yielded, on average, about 21% (46 bushels per acre) higher than pureline varieties, both for Clearfield® and conventional types, in Mississippi rice variety trials. For 2021, this hybrid/FullPage® yield advantage was, on average, 30% over Clearfield® and 10% over conventional variety types. However, since the plot border effect is greater on hybrids than in purelines, the actual yield differences may be expected to be closer when comparing the highest-yielding hybrid to the highest-yielding purelines.

Among the 16 Clearfield®/Provisia® pureline entries, the highest-yielding entry was an experimental breeding line: RU2104087, 260 bushels per acre. This was followed by CLL16 a released variety with 258 bushels per acre. Occupying the third to fifth highest-yielding spots were entries that have performed also in previous years: RU2004071 (252 bushels per acre), CLX54197 (249 bushels), and RU2004191 along with RU2004195 (tied with 241 bushels). RU2004191 was the highest yielding across locations (274 bushels) in this group in the 2020 trials followed by RU2004071 (269 bushels). The Mississippi-bred long-grain Clearfield® potential release CLX54197 that has the unique Cheniere-type cereal chemistry was also among the top entries for yield in the 2018, 2019, and 2020 on-farm yield evaluations. The released Clearfield® varieties CL163 and CL153, that were the highest yielding in 2019 but not in 2020 again did not perform well in 2021. CL153 had been the highest-yielding Clearfield® released long-grain variety entry in these trials both in 2017 (223 bushels) and 2018 (220 bushels). The released Provisia® pureline variety PVL02 was ranked last for yield in the group—similar to the situation in the 2020 trials—as it was one of the entries most affected by plot lodging (average of 55%) in five of the seven locations with lodging occurrence in 2021.

Among conventional purelines, the three highest-yielding entries were all experimental lines under development: RU2004091 (270 bushels per acre), RU1904139 (260 bushels), and RU1904163 (258 bushels). RU1904163 was the second highest-yielding entry in the 2020 trials with 275 bushels per acre. In the fourth spot in 2021 was Diamond (257 bushels), an Arkansas-bred variety that has become popular among Mississippi growers due to its having topped the 2019 and 2017 trials. Very closely following Diamond and tied for the fifth highest-yielding spot were two experimental breeding lines: RU1904155 and RU2104099, each with 256 bushels per acre. The Mississippi-released variety Thad, which topped these trials in 2020, did not perform as well in 2021. Rex, another Mississippi variety that remains popular among Mississippi growers due to its consistently good performance in these trials during the past 5 years also did not fare well in 2021.

Entries that begin with RU designations are elite experimental breeding lines that have performed well in the sequential, multistage, yield evaluation conducted by the MSU rice-breeding program. They have usually been entered or are about to be entered in the multistate Rice Uniform (hence, RU) Regional Research Nursery or URRN. This URRN system is conducted by public breeding institutions in the U.S. to evaluate elite lines in other rice-growing states while sharing elite materials among U.S. breeders. The entries represent the best lines from different breeding programs and are typically at the final stages of testing. *Entries from Mississippi in the URRN have the number "4" as the first digit of the last four digits of the RU designation (e.g., RU200**4**191).*

Table 12 shows the agronomic, yield, and milling data for select rice varieties that have been included in on-farm tests for the last 3 years. Based on varietal performance in 21 trials conducted during the past 3 years (2019, 2020, and 2021), the yield performance of conventional varieties Diamond, Thad, and Rex were statistically similar at 253, 248, and 247 bushels per acre, respectively. In comparison, Cheniere, a variety from Louisiana that was popular in previous years among Mississippi producers and remains to be a premium variety for grain quality, yielded an average of 217 bushels per acre in the same trials.

Among the Clearfield® released varieties, the best performer during the past 3 years (2019, 2020, 2021) has CLL15 with 233 bushels per acre that was statistically tied with CL153 (232 bushels) and CL163 (229 bushels). Although CL153 had been a consistent high yielder in past trials, several breeding lines still under development have outyielded CL153 in the recent past. Among these promising Clearfield® experimental lines that outyielded all other released Clearfield® varieties is CLX54197 (formerly coded as RU1504197), which had the fourth highest yield in 2019 among Clearfield® trial entries. It was ranked third in 2018 and performed well also in 2017 (223 bushels per acre). Moreover, this line outyielded all released long-grain Clearfield® varieties included in the tests in all 3 years except for CLL16 in 2020 and 2021. CLX54197 is like Thad and CL163 in terms of having high amylose content but is like the erstwhile popular variety Cheniere in terms of having "softer-cooking" quality. This elite Clearfield® breeding line was therefore recommended for release by the MAFES in August 2021. It will be marketed as CLHA02 by HorizonAg.

Milling traits varied substantially among the test entries, and high-yielding entries did not necessarily have the best grain-quality characteristics. Aside from these trait considerations for variety selection, performance stability over different environments and across years also needs to be considered. Certain varieties such as Cheniere have been relatively stable over many years, thus have been popular in Mississippi and the Midsouth in the past. Thad has been unanimously accepted by all major rice-milling and exporting companies in the U.S. due to its excellent grain quality traits that is also favored by sectors of the rice food-processing industry. Rex, on the other hand, continues to be popular among rice growers due to its excellent yield stability over multiple locations both in Mississippi and other rice-growing states in the Midsouth.

Variety and hybrid reactions to common diseases and straight head disorder are listed in **Table 13**. Decisions about the use of fungicides should be made considering a variety's susceptibility to a particular disease, the potential for the disease to cause economic loss, and efficacy of fungicides that are available to combat or prevent the respective disease.

Nitrogen fertilization rate guidelines are provided in **Table 14**. These guidelines were generated from multiyear, multisite N response studies conducted for newly released varieties. A combination of current economics, individual varieties' susceptibility to lodging, and yield potential are included in determining the rate guidelines. Annually, coarse-textured soils, commonly referred to as silt loams, require approximately 30 pounds per acre less nitrogen than fine-textured or clay soils. By applying less N on silt loam soils, disease and lodging incidence tend to decrease without sacrificing yield and quality.

Based on this year's variety-trial results and taking into consideration previous years' performance, the conventional varieties suggested for Mississippi rice growers are Thad, Diamond, and Rex. The conventional variety Cheniere has not performed as well as the varieties mentioned though it has done well in Mississippi in the past. The recent release of Thad and CL163, both high-amylose varieties with excellent grain qualities and cereal chemistry profiles desired by the rice-processing industry, provides more varietal options to the industry, as well as U.S. rice export markets requiring high-amylose rice.

For RiceTec's hybrids using the new FullPage® (FP) technology that provides growers with new generation IMI herbicide tolerance to control red rice, the best option based on 3 years of trial data (2019, 2020, and 2021) is RT7521FP, which topped all entries regardless of type for yield in 2019, was the top-yielding FP entry in 2020 (with 271 bushels per acre), and again topped this year's trials (292 bushels) along with RT7401. For conventional hybrid rice production, XP753 remains the proven best option based on several years' yield data. Detailed additional information on production of conventional and FullPage® hybrids is available at RiceTec, Inc. (https://www.ricetec.com/products-services/seed-products/).

Among the Clearfield® released varieties that are offered exclusively by HorizonAg (http://www.horizon-seed.com/horizon/content/varieties), the recently released long-grain type CLL16, along with the upcoming release CLHA02 outperformed CL153, which was the best performing long-grain Clearfield® variety type in the past 5 years. CLHA02 and CL163, both developed by the MAFES rice-breeding program, are the only high-amylose rice options in commercial production today among long-grain Clearfield® rice varieties. There were no medium-grain Clearfield® entries in the 2021 trials. Clearfield® rice should be used as a tool with careful attention given to stewardship so that the technology can last into the future. Stewardship should encompass minimizing the potential for outcrossing of red rice and Clearfield® rice. Stewardship should also include the addition of postemergence and residual herbicides for grass control so that selection pressure that could break down herbicide resistance is minimized. It should be noted that incidences of ALS-resistant (Newpath®, Beyond®) barnyardgrass and sedges have increased in the last few years. Outcrossing and grass resistance jeopardize this important technology. The new Provisia® varieties such as PVL02, which was tested in these trials for the second time in 2021, promises to be a useful companion technology to extend the usefulness of Clearfield® rice system for controlling red rice. However, it is important to follow the technology recommendations, such as being out of rice for a year when switching from Clearfield® to Provisia® varieties.

As is well known to rice producers, no pureline variety or hybrid is always perfect for all cropping conditions. Each cropping year may bring about recurring or new biological and/or environmental factors with the potential to negatively impact varietal performance and, ultimately, a rice producer's bottom line. Breeders must, therefore, continue to develop new strains that satisfy the needs of both producers and end users. The breeding program must cater to the needs of rice growers who are faced with an ever-changing production landscape. At the same time, it must also consider the varying needs of millers, the food industry, and consumers who continually demand higher quality rice for consumption and/or processing. The best of these new strains must perform well under farm conditions before they can be released. Each new variety release would be expected to have qualities or characteristics that add value to end-users. Ultimately, varietal performance over time and in different environments, in addition to economics, should be considered when choosing which variety to plant among the many available options. This is where the regular conduct of on-farm trials derives a great value for rice producers. For varieties with high yield potential, producers should consider risks such as lodging and disease incidence and plan to manage for those yield-limiting factors to derive maximum benefit. Planting several pureline varieties or hybrids, FullPage®, Clearfield®, Provisia®, and conventional types may help mitigate the risks associated with large production areas that are commonly found in Mississippi.

Table 3. Performance of rice varieties, hybrids, and experimental lines grown on Sharkey clay soil near Choctaw, Mississippi (33°60'07"N, 90°91'72"W), 2021.[1]

Entry	Yield[2]	Whole milled rice	Total milled rice	Chalk[3]	Harvest moisture	Bushel weight	Plant height	50% heading[4]	Lodging[5]	Lodging score[6]	1,000 seed weight[7]
	bu/A	*%*	*%*	*%*	*%*	*lb*	*in*	*days*	*%*	*(1-5)*	*g*
Hybrids											
RT7321	197	29.5	66.7	10.4	11.8	41.9	42.5	82	0	1	26.0
RT7401	225	27.2	67.9	9.7	10.8	41.8	41.5	83	0	1	25.7
RT7421	229	21.0	67.2	13.0	10.8	42.8	40.5	83	0	1	25.9
RT7521	253	41.3	65.8	9.5	10.6	40.6	44.0	82	0	1	25.5
RT7523 FP	243	42.3	67.5	5.6	10.6	40.4	42.0	85	0	1	25.0
Clearfield/Provisia											
CL153	230	46.6	70.4	5.2	10.7	43.8	39.0	83	0	1	26.3
CL163	184	49.3	68.7	11.2	11.4	43.4	38.8	85	0	1	23.3
CLL15	207	46.1	68.7	4.8	10.3	42.7	37.0	85	0	1	23.2
CLL16	233	36.8	65.7	6.2	15.7	44.7	39.8	87	0	1	24.6
CLL17	182	48.7	68.2	8.6	11.5	42.8	38.5	85	0	1	22.4
CLX54197	229	42.3	68.4	10.5	12.3	45.4	36.3	86	0	1	24.3
PVL02	125	50.2	70.8	6.3	13.1	42.7	37.8	84	0	1	20.6
RU1804147	217	56.7	69.5	8.8	13.3	45.2	41.3	85	0	1	26.2
RU2004191	208	44.8	67.9	6.1	12.1	44.2	39.8	86	0	1	26.5
RU2004187	199	59.4	68.7	5.6	13.1	44.5	41.8	85	0	1	24.7
RU2004195	224	51.1	68.0	10.2	14.1	45.2	40.8	84	0	1	27.3
RU2004071	217	45.6	68.0	7.2	14.3	44.4	38.5	88	0	1	24.0
RU2004224	195	58.4	69.9	4.1	11.9	43.6	39.0	86	0	1	23.7
RU2104135	204	37.7	69.7	4.8	14.7	45.7	40.3	87	0	1	23.1
RU2104139	132	44.5	66.6	11.6	16.2	43.6	42.5	87	0	1	22.8
RU2104087	232	49.6	67.3	11.0	12.2	42.8	41.5	86	0	1	26.0
Conventional											
Cheniere	214	51.7	71.4	4.7	11.1	43.4	34.5	84	0	1	20.8
Diamond	226	35.5	68.8	2.8	12.5	45.0	41.0	87	0	1	25.8
Rex	227	52.9	67.3	8.6	11.6	43.5	40.5	87	0	1	27.7
Thad	187	41.5	67.8	9.3	12.7	45.0	37.3	87	0	1	24.7
RU2004091	249	46.0	68.3	11.4	13.9	43.8	41.0	88	0	1	25.7
RU1904139	215	44.8	66.5	14.7	13.3	44.2	38.0	88	0	1	24.5
RU1904163	247	33.7	67.0	9.4	11.1	43.6	34.8	87	0	1	23.6
RU2004099	229	40.3	68.6	6.1	13.7	45.5	40.5	87	0	1	22.6
RU1904155	223	33.0	67.4	9.9	11.7	45.4	40.0	88	0	1	24.6
RU2004083	233	47.7	68.3	8.3	13.1	45.3	40.3	88	0	1	22.5
RU1904123	227	42.8	67.7	8.6	11.0	45.7	39.3	86	0	1	25.2
RU2104075	238	39.2	67.9	7.3	10.1	43.7	40.5	85	0	1	25.5
RU2104099	234	53.7	70.7	7.3	11.1	42.3	41.3	86	0	1	23.3

[1]**Planting date:** April 19. **Emergence:** May 2. **Harvested:** Sept. 9. **Management:** (sprayed) April 19 – Command @ 21 fl oz/A, Invade @ 12.8 fl oz/A, Sharpen @ 2 fl oz/A, Roundup Powermax 3 @ 32 fl oz/A; May 25 – Dyne-A-Pak @ 12.8 fl oz/A, Grandstand R @ 0.67 pt/A, Regiment @ 0.60 oz/A; July 21 – Stratego (fungicide) @ 19 fl oz/A; July 28 – Warrior (insecticide) 2 @ 2 fl oz/A. **Flooded:** May 26. **Drained:** Aug. 9. **LSD = A difference of 21 bu/A is required for one variety to differ from another at the 5% probability level. C.V. = 5.8%**

[2]Rough rice at 12% moisture.

[3]Winseedle chalk measurement.

[4]Days after emergence.

[5]Percent of plot that was lodged.

[6]Severity of lodging: 1 = plants totally erect, 5 = plants completely on ground.

[7]Weight of 1,000 kernels.

Table 4. Performance of rice varieties, hybrids, and experimental lines grown on Alligator clay soil near Clarksdale, Mississippi (34°03'47"N, 90°59'40"W), 2021.[1]

Entry	Yield[2]	Whole milled rice	Total milled rice	Chalk[3]	Harvest moisture	Bushel weight	Plant height	50% heading[4]	Lodging[5]	Lodging score[6]	1,000 seed weight[7]
	bu/A	*%*	*%*	*%*	*%*	*lb*	*in*	*days*	*%*	*(1-5)*	*g*
Hybrids											
RT7321	324	28.1	68.7	8.5	11.9	42.2	47.5	81	0	1	25.8
RT7401	316	30.6	69.6	4.8	9.3	42.2	45.8	81	0	1	25.3
RT7421	320	26.6	69.1	8.9	11.0	43.0	42.5	81	0	1	24.9
RT7521	306	39.1	67.8	5.7	9.7	41.4	47.0	81	0	1	24.3
RT7523 FP	311	28.7	68.5	5.0	6.8	41.4	45.5	83	0	1	26.7
Clearfield/Provisia											
CL153	260	42.5	70.1	2.5	9.9	44.6	37.8	80	0	1	25.8
CL163	247	44.1	68.7	8.6	11.8	44.5	40.0	82	0	1	24.7
CLL15	211	42.0	69.0	3.4	10.9	42.7	35.5	81	0	1	23.0
CLL16	261	37.8	67.1	4.2	10.7	45.6	39.3	83	0	1	24.1
CLL17	274	47.8	68.9	4.1	8.1	43.7	38.8	82	45	3	21.3
CLX54197	276	31.0	68.5	7.0	9.0	46.5	36.0	82	0	1	23.9
PVL02	232	51.3	72.1	3.9	11.9	44.1	38.3	82	40	3	20.8
RU1804147	288	51.7	68.7	6.5	6.6	45.8	38.3	82	0	1	26.2
RU2004191	275	46.4	68.6	3.3	8.1	44.7	37.3	83	0	1	27.1
RU2004187	267	55.7	68.6	3.9	11.2	45.7	41.8	85	0	1	24.8
RU2004195	292	45.2	68.1	5.7	9.2	46.0	39.3	82	0	1	25.9
RU2004071	289	34.5	67.5	6.0	12.0	44.7	39.5	84	0	1	24.5
RU2004224	252	52.3	69.4	2.4	12.3	44.8	38.8	82	0	1	22.6
RU2104135	247	28.4	69.1	3.8	14.8	46.2	41.8	83	0	1	22.9
RU2104139	184	38.0	67.3	7.8	12.8	44.7	41.8	83	88	4	23.1
RU2104087	292	41.4	66.9	5.6	7.1	44.2	39.8	82	0	1	26.5
Conventional											
Cheniere	250	46.9	71.0	4.4	12.2	43.5	36.8	82	0	1	19.9
Diamond	299	37.9	69.6	2.6	10.8	45.5	43.8	83	0	1	25.9
Rex	274	51.3	67.8	5.7	8.6	44.9	41.0	82	0	1	26.5
Thad	280	33.2	67.9	7.0	13.4	46.2	39.8	82	0	1	23.7
RU2004091	295	45.2	68.0	9.1	9.6	44.4	40.3	83	0	1	25.7
RU1904139	292	39.0	66.9	10.2	7.6	44.8	40.5	83	0	1	24.8
RU1904163	295	18.7	68.2	9.3	10.0	44.1	37.0	84	0	1	23.4
RU2004099	280	39.0	69.2	4.6	11.5	46.3	40.0	85	0	1	22.5
RU1904155	278	31.4	67.9	5.8	8.5	45.7	38.5	84	0	1	24.2
RU2004083	284	50.0	69.1	5.4	13.2	45.7	41.5	83	0	1	22.7
RU1904123	262	28.1	66.5	7.7	10.2	46.3	38.0	83	0	1	26.5
RU2104075	299	38.8	68.3	4.2	9.7	44.7	41.8	80	0	1	25.2
RU2104099	294	45.1	68.8	3.6	8.1	43.2	41.5	84	0	1	23.8

[1]**Planting date:** April 20. **Emergence:** May 2. **Harvested:** Sept. 13. **Management:** (sprayed) May 15 – Ricebo @ 3 qt/A, Permit @ 0.7 oz/A, Facet L @ 32 fl oz/A, Prowl @ 32 fl oz/A; (fertilized) April 13 – MEZ @ 100 lb/A, Potash @ 50 lb/A; May 15 – Urea @ 100 lb/A; July 5 – Urea @ 100 lb/A; July 30 – Urea @ 75 lb/A. **LSD = A difference of 29 bu/A is required for one variety to differ from another at the 5% probability level. C.V. = 6.4%**
[2]Rough rice at 12% moisture.
[3]Winseedle chalk measurement.
[4]Days after emergence.
[5]Percent of plot that was lodged.
[6]Severity of lodging: 1 = plants totally erect, 5 = plants completely on ground.
[7]Weight of 1,000 kernels.

Table 5. Performance of rice varieties, hybrids, and experimental lines grown on Sharkey clay soil near Hollandale, Mississippi (33°16'68"N, 90°81'37"W), 2021.[1]											
Entry	Yield[2]	Whole milled rice	Total milled rice	Chalk[3]	Harvest moisture	Bushel weight	Plant height	50% heading[4]	Lodging[5]	Lodging score[6]	1,000 seed weight[7]
	bu/A	*%*	*%*	*%*	*%*	*lb*	*in*	*days*	*%*	*(1-5)*	*g*
Hybrids											
RT7321	270	25.7	70.1	6.9	8.6	41.8	46.8	77	95	4	24.4
RT7401	311	30.2	70.7	6.5	8.9	41.6	44.8	77	35	3	23.1
RT7421	308	24.9	69.9	11.2	9.0	42.3	42.5	79	60	3	23.4
RT7521	317	31.6	67.7	8.7	9.4	40.6	49.5	80	75	4	22.6
RT7523 FP	326	31.3	69.1	4.8	10.2	40.7	47.3	82	15	2	24.5
Clearfield/Provisia											
CL153	237	30.7	70.4	6.5	10.3	43.8	40.5	80	0	1	24.7
CL163	251	41.8	68.0	14.3	10.8	43.5	44.3	83	100	4	23.3
CLL15	227	33.0	69.7	5.6	10.3	43.0	40.0	81	85	4	23.0
CLL16	299	29.4	68.6	6.2	12.1	45.7	43.5	79	10	2	24.2
CLL17	235	43.4	68.8	5.5	11.1	42.7	40.8	81	100	4	21.0
CLX54197	248	33.2	68.5	8.7	11.7	45.5	40.3	82	45	3	22.8
PVL02	147	42.8	71.2	5.0	11.0	42.9	43.3	81	100	4	19.5
RU1804147	295	50.4	69.1	11.0	8.1	45.3	43.5	82	0	1	26.3
RU2004191	285	33.4	68.7	7.2	7.4	43.2	40.5	82	0	1	25.9
RU2004187	257	55.8	68.9	4.9	10.5	45.1	47.3	83	0	1	24.6
RU2004195	268	39.7	68.4	8.7	10.6	44.7	44.5	81	15	2	25.3
RU2004071	300	43.2	69.7	5.0	11.4	45.3	44.8	85	0	1	24.5
RU2004224	236	53.0	69.7	5.0	11.5	43.5	42.0	84	45	3	22.0
RU2104135	266	22.1	69.3	3.2	11.2	46.2	45.3	84	0	1	23.8
RU2104139	231	35.9	67.8	8.2	12.2	44.8	46.8	83	90	4	21.8
RU2104087	298	31.8	66.4	11.5	7.8	42.9	44.3	82	10	2	25.7
Conventional											
Cheniere	172	40.9	71.3	4.4	10.4	42.0	37.3	82	100	4	18.9
Diamond	269	28.7	69.8	3.4	9.4	45.1	45.0	84	48	3	25.7
Rex	272	40.8	66.7	8.4	9.5	43.6	42.0	82	0	1	25.2
Thad	246	31.0	68.4	11.1	11.9	44.7	42.3	83	93	4	23.5
RU2004091	283	41.7	67.7	10.8	8.4	43.7	42.5	84	50	3	25.2
RU1904139	295	42.4	67.5	11.7	9.2	44.4	41.0	86	0	1	23.1
RU1904163	258	15.3	68.0	11.5	8.9	42.6	38.8	83	50	3	22.2
RU2004099	250	28.1	69.7	7.1	9.9	45.9	42.3	83	40	3	21.8
RU1904155	280	22.7	66.8	13.8	7.4	45.3	42.0	81	0	1	24.1
RU2004083	257	38.0	69.5	6.3	10.6	45.5	45.0	83	50	3	22.7
RU1904123	233	26.9	67.0	7.5	11.2	44.8	42.5	81	50	3	24.6
RU2104075	228	25.7	68.6	8.1	10.5	43.5	41.8	81	90	4	25.2
RU2104099	286	38.7	69.3	5.0	9.2	43.3	43.8	82	0	1	23.5

[1]**Planting date:** April 5. **Emergence:** April 22; **Harvested:** Sept. 13. **Management:** (sprayed) Feb. 26 – Roundup @ 3 pt/A, 2-4D @ 1 qt/A; April 5 – Roundup @ 1 qt/A, Command @ 1-6 fl oz/A, Sharpen @ 1.5 fl oz/A. May 26 – Permit @ 0.65 oz/A, Grandstand @ 2/3 pt/A, Phase 2 @ 1%; June11 – Facet @ 1 qt/A, 1 qt Oil; July 12 – Stratego @ 19 oz/A; (fertilized) April 21 – 50% DAP and 50% Ammonia Sulfate @ 100 lb/A; May 26 – Urea @ 150 lb/A; June11 – Urea @ 100 lb/A; June 22 – Urea @ 100 lb/A; June 29 – Urea @ 100 lb/A. **Flooded:** May 27. **Drained:** Aug. 1. **LSD = A difference of 36 bu/A is required for one variety to differ from another at the 5% probability level. C.V. = 8.4%**

[2]Rough rice at 12% moisture.

[3]Winseedle chalk measurement.

[4]Days after emergence.

[5]Percent of plot that was lodged.

[6]Severity of lodging: 1 = plants totally erect, 5 = plants completely on ground.

[7]Weight of 1,000 kernels.

Table 6. Performance of rice varieties, hybrids, and experimental lines grown on Sharkey clay soil near Pace, Mississippi (33°79'25"N, 90°84'92"W), 2021.[1]

Entry	Yield[2]	Whole milled rice	Total milled rice	Chalk[3]	Harvest moisture	Bushel weight	Plant height	50% heading[4]	Lodging[5]	Lodging score[6]	1,000 seed weight[7]
	bu/A	*%*	*%*	*%*	*%*	*lb*	*in*	*days*	*%*	*(1-5)*	*g*
Hybrids											
RT7321	286	52.6	70.8	8.0	6.5	42.3	47.0	79	0	1	25.2
RT7401	298	59.1	71.8	6.2	14.8	42.2	45.3	79	0	1	24.2
RT7421	302	60.8	72.2	6.8	14.9	42.8	45.3	78	0	1	23.9
RT7521	283	57.5	69.2	5.9	17.6	40.8	46.8	79	0	1	23.5
RT7523 FP	269	57.2	69.7	4.1	12.2	41.0	45.5	82	0	1	25.0
Clearfield/Provisia											
CL153	235	58.3	71.6	4.8	16.4	44.3	42.3	79	0	1	24.6
CL163	215	59.1	69.4	7.6	20.8	42.3	43.8	82	0	1	22.9
CLL15	218	60.4	70.7	4.5	18.8	42.3	39.5	81	0	1	21.6
CLL16	267	54.3	68.1	4.3	13.2	43.9	44.0	83	0	1	22.9
CLL17	208	61.7	69.9	5.2	17.2	43.7	40.5	79	15	2	21.3
CLX54197	237	60.5	70.4	7.1	18.8	45.4	39.8	80	0	1	21.4
PVL02	176	67.7	73.7	6.0	17.0	43.6	43.5	80	70	3	19.8
RU1804147	241	63.6	71.0	6.0	17.2	45.4	43.8	81	0	1	25.8
RU2004191	261	59.5	69.6	4.8	13.3	44.1	42.8	83	0	1	24.7
RU2004187	258	59.8	69.3	5.7	15.2	44.7	45.3	84	0	1	22.5
RU2004195	251	60.5	69.8	5.8	14.8	45.1	44.3	81	0	1	23.8
RU2004071	261	62.0	71.5	3.7	25.4	43.2	43.0	83	0	1	21.8
RU2004224	243	65.1	72.1	4.1	16.6	43.6	41.5	81	0	1	21.2
RU2104135	219	55.6	71.6	3.1	17.4	46.5	42.8	82	0	1	22.8
RU2104139	177	59.2	69.6	7.9	27.6	42.3	47.0	81	38	2	23.3
RU2104087	245	55.0	67.0	6.6	12.7	43.3	43.0	81	0	1	25.2
Conventional											
Cheniere	219	63.1	72.8	4.3	18.0	43.3	40.3	82	0	1	20.3
Diamond	246	58.3	71.4	2.6	21.5	44.6	47.8	83	0	1	24.8
Rex	255	58.4	68.5	5.4	17.1	44.1	43.8	82	0	1	25.0
Thad	254	59.7	69.2	3.5	19.1	45.6	42.0	81	0	1	23.6
RU2004091	270	52.4	70.0	6.5	21.8	42.4	45.5	83	10	2	23.1
RU1904139	262	59.0	69.5	7.6	21.0	43.2	43.3	82	0	1	22.9
RU1904163	246	51.5	68.7	4.0	20.6	43.0	40.3	83	0	1	21.7
RU2004099	229	58.3	70.7	4.0	19.4	44.6	44.3	85	0	1	21.4
RU1904155	261	55.5	68.7	7.2	17.9	43.7	44.8	83	0	1	21.3
RU2004083	253	61.4	71.7	4.5	15.8	44.4	46.0	83	0	1	21.2
RU1904123	275	56.3	69.3	5.9	9.0	46.3	40.8	82	0	1	24.7
RU2104075	281	53.5	70.1	3.4	11.5	44.9	45.5	80	0	1	24.8
RU2104099	243	55.6	70.0	5.6	18.1	42.1	44.3	84	0	1	22.7

[1]**Planting date:** April 7. **Emergence:** April 22. **Harvested:** Sept. 8. **Management:** (sprayed) April 7 – Command @ 1:10 fl oz/A, Roundup @ 1 qt/A, Sharpen @ 2 fl oz/A, 1% Fire zone; May 20 – Regiment @ 0.56 oz/A, Facet @ 32 fl oz/A, Permit @ 0.7 oz/A; Aug. 12 – Karate @ 1:70 fl oz/A; (fertilized) April 24 – DAP and Ammonia Sulfate @ 100 lb/A; June 20 – Urea @ 100 lb/A; July 19 – Urea @ 75 lb/A. **Flooded:** May 20. **Drained:** Aug. 18. **LSD = A difference of 43 bu/A is required for one variety to differ from another at the 5% probability level. C.V. = 8.5%**

[2]Rough rice at 12% moisture.

[3]Winseedle chalk measurement.

[4]Days after emergence.

[5]Percent of plot that was lodged.

[6]Severity of lodging: 1 = plants totally erect, 5 = plants completely on ground.

[7]Weight of 1,000 kernels.

Table 7. Performance of rice varieties, hybrids, and experimental lines grown on Forestdale silty clay loam soil near Shaw, Mississippi (34°76’54”N, 90°69’64”W), 2021.[1]											
Entry	**Yield**[2]	**Whole milled rice**	**Total milled rice**	**Chalk**[3]	**Harvest moisture**	**Bushel weight**	**Plant height**	**50% heading**[4]	**Lodging**[5]	**Lodging score**[6]	**1,000 seed weight**[7]
	bu/A	*%*	*%*	*%*	*%*	*lb*	*in*	*days*	*%*	*(1-5)*	*g*
Hybrids											
RT7321	328	47.8	70.0	6.8	14.2	42.6	48.3	87	0	1	26.3
RT7401	316	43.9	68.9	6.9	13.9	42.8	44.5	87	0	1	26.2
RT7421	323	47.5	69.1	9.7	14.0	43.2	43.8	88	0	1	25.9
RT7521	322	54.0	68.6	6.8	13.4	41.1	48.8	87	0	1	23.9
RT7523 FP	304	49.6	68.6	6.5	14.1	41.3	47.0	88	0	1	27.4
Clearfield/Provisia											
CL153	246	58.8	70.7	2.5	13.8	44.2	41.5	85	0	1	26.0
CL163	228	57.8	69.3	10.5	15.6	43.9	42.3	88	75	3	23.0
CLL15	230	61.9	70.4	4.8	15.0	42.5	40.5	87	0	1	22.2
CLL16	277	52.9	68.0	6.2	21.1	45.0	44.5	87	0	1	23.2
CLL17	242	62.1	70.2	4.0	13.7	43.2	42.0	88	83	3	20.9
CLX54197	287	57.7	69.1	9.6	8.2	45.4	39.8	88	0	1	22.7
PVL02	198	64.6	72.2	5.9	14.6	43.1	43.8	88	80	3	22.2
RU1804147	276	62.4	70.1	8.7	11.3	45.2	44.8	88	0	1	26.3
RU2004191	259	60.7	69.5	4.0	13.4	44.2	41.5	88	0	1	26.4
RU2004187	267	61.0	68.9	5.8	12.0	45.2	46.8	90	0	1	24.2
RU2004195	259	58.9	68.8	7.0	14.2	45.8	43.5	90	0	1	26.0
RU2004071	276	52.6	67.9	6.7	18.7	44.4	41.0	87	0	1	24.6
RU2004224	232	63.5	70.3	2.2	15.6	44.1	42.8	87	0	1	23.0
RU2104135	229	44.3	69.1	4.1	18.6	46.5	42.3	87	0	1	23.7
RU2104139	177	54.4	68.7	6.7	21.2	44.2	47.8	88	88	3	22.4
RU2104087	290	54.8	67.4	7.2	9.6	43.4	43.8	87	0	1	26.7
Conventional											
Cheniere	242	61.0	71.6	4.2	15.7	44.1	37.5	87	0	1	20.9
Diamond	283	55.2	70.5	3.6	14.1	45.3	48.0	90	0	1	25.4
Rex	254	59.8	68.5	5.5	12.1	44.5	42.0	88	0	1	25.7
Thad	282	58.1	68.7	4.7	15.9	46.1	41.3	88	0	1	24.0
RU2004091	283	49.9	68.8	9.0	16.1	43.6	43.3	88	0	1	24.3
RU1904139	273	60.5	67.7	10.4	17.0	43.1	44.3	89	0	1	23.6
RU1904163	290	40.5	66.7	5.4	9.8	43.6	37.3	87	0	1	22.6
RU2004099	267	55.2	70.2	5.1	14.0	46.2	42.5	89	0	1	23.6
RU1904155	271	50.1	68.6	8.6	11.3	45.8	44.5	88	0	1	24.4
RU2004083	282	56.3	69.8	5.8	14.3	45.8	43.8	87	0	1	23.5
RU1904123	248	52.5	68.2	6.5	14.1	46.9	39.3	87	0	1	26.2
RU2104075	262	50.6	69.1	5.8	10.3	44.4	43.0	84	0	1	26.4
RU2104099	292	55.1	69.6	6.0	11.9	42.9	45.5	88	0	1	23.8

[1]**Planting date:** April 19. **Emergence:** May 2. **Harvested:** Sept. 8. **Management:** (sprayed) April 24 – Clasp @ 3.25 fl oz/A, Mso @ 5.5 fl oz/A, Sharpen @ 2 fl oz/A, Roundup PowerMAX 3 @ 30 fl oz/A; May 28 – Scanner @ 3 fl oz/A, AIM 2EC @ 0.75 fl oz/A, Facet L @ 22 fl oz/A; June 14 – Agri-Dex @ 1 qt/A, Clincher SF @ 15 fl oz/A; (fertilizer) May 5 – 18-46-0 @ 100 lb/A; May 12 – 41-0-0 @ 100 lb/A; June 2 – 41-0-0 @ 100 lb/A; June 19 – 41-0-0 @ 100 lb/A; July 19 – 41-0-0 @ 100 lb/A. **Flooded:** June 7. **Drained:** Aug. 15. **LSD = A difference of 26 bu/A is required for one variety to differ from another at the 5% probability level. C.V. = 5.9%**

[2]Rough rice at 12% moisture.

[3]Winseedle chalk measurement.

[4]Days after emergence.

[5]Percent of plot that was lodged.

[6]Severity of lodging: 1 = plants totally erect, 5 = plants completely on ground.

[7]Weight of 1,000 kernels.

Table 8. Performance of rice varieties, hybrids, and experimental lines grown on Sharkey clay soil near Stoneville, Mississippi (33°43'14"N, 90°90'76"W), 2021.[1]

Entry	Yield[2]	Whole milled rice	Total milled rice	Chalk[3]	Harvest moisture	Bushel weight	Plant height	50% heading[4]	Lodging[5]	Lodging score[6]	1,000 seed weight[7]
	bu/A	%	%	%	%	lb	in	days	%	(1-5)	g
Hybrids											
RT7321	202	50.7	70.4	5.4	12.7	42.3	51.3	89	35	2	23.3
RT7401	311	59.7	72.0	4.5	11.5	42.2	48.8	91	0	1	23.5
RT7421	299	53.5	71.2	6.7	9.6	41.6	46.3	90	0	1	23.4
RT7521	297	60.1	70.4	4.6	12.5	41.0	49.0	91	0	1	23.7
RT7523 FP	303	58.2	70.0	4.3	12.2	40.6	51.0	94	0	1	24.8
Clearfield/Provisia											
CL153	213	64.0	71.8	2.0	13.0	44.1	43.5	91	0	1	22.8
CL163	232	61.2	70.3	7.1	13.0	42.8	46.0	95	0	1	21.1
CLL15	214	63.5	71.1	3.7	14.0	43.1	42.5	91	0	1	21.2
CLL16	237	60.3	70.1	3.4	15.5	45.5	46.0	94	0	1	22.7
CLL17	161	62.3	70.3	4.3	15.5	42.3	44.0	94	30	2	20.3
CLX54197	238	62.2	70.8	7.4	13.9	45.0	40.0	93	0	1	21.7
PVL02	94	59.7	71.7	4.2	15.1	43.1	44.5	89	93	4	17.6
RU1804147	150	63.0	70.3	7.8	16.5	44.7	46.5	93	25	2	24.8
RU2004191	216	61.4	70.0	4.8	13.8	43.9	44.8	90	0	1	24.0
RU2004187	214	61.6	69.7	6.2	15.4	44.3	47.5	93	0	1	22.4
RU2004195	204	62.0	70.2	6.2	15.3	44.8	45.3	90	0	1	23.8
RU2004071	233	64.3	71.7	3.3	18.3	44.7	44.5	96	0	1	23.0
RU2004224	196	64.1	71.2	2.9	13.0	43.0	42.0	93	0	1	20.8
RU2104135	175	59.2	70.9	3.2	16.9	44.8	48.5	95	70	4	21.5
RU2104139	105	60.4	69.8	6.4	20.8	43.0	48.3	94	88	4	21.9
RU2104087	227	58.5	68.5	6.8	13.3	42.1	46.5	94	30	2	24.2
Conventional											
Cheniere	204	65.4	73.7	3.5	12.4	42.7	39.5	91	0	1	18.9
Diamond	246	58.8	71.4	2.6	15.4	45.4	48.5	94	0	1	24.4
Rex	231	62.5	70.0	4.1	12.9	42.8	47.0	93	45	3	23.0
Thad	230	61.9	70.1	3.8	15.3	44.9	44.3	94	0	1	21.8
RU2004091	238	50.6	69.2	8.1	15.5	43.4	46.5	95	0	1	23.6
RU1904139	250	60.8	69.5	7.8	16.8	45.0	44.3	94	0	1	22.7
RU1904163	240	55.6	69.3	4.0	14.4	43.4	40.8	94	0	1	21.6
RU2004099	229	63.0	71.8	5.0	18.6	46.3	45.3	95	0	1	21.0
RU1904155	242	59.3	70.4	5.1	14.0	45.4	46.5	95	0	1	21.8
RU2004083	267	64.6	72.0	4.5	12.6	45.9	48.0	95	0	1	20.8
RU1904123	239	59.2	69.8	6.5	14.2	44.7	44.8	94	0	1	22.2
RU2104075	238	58.7	71.4	5.8	12.8	43.5	46.5	91	20	2	21.9
RU2104099	248	59.7	70.4	4.0	16.2	42.8	49.0	96	0	1	21.5

[1]**Planting date:** April 28. **Emergence:** May 9. **Harvested:** Sept. 27. **Management:** (sprayed) April 29 – Sharpen @ 2 fl oz/A, Command @ 12 fl oz/A, Gramoxone @ 32 fl oz/A, Voyager @ 1 qt/100 gallons; June 1 – Facet @ 32 fl oz/A; Navigator @ 16 fl oz/A, Permit @ 2/3 oz/A, Stam @ 1 gal/A; June 23 – Stam @ 1 gal/A, Permit @ 2/3 oz/A, Facet @ 32 fl oz/A, Navigator @ 16 fl oz/A; June 4 – Newpath @ 6 fl oz/A, Navigator @ 1%/tank); (fertilized) June 23 – 150 lb/A of Urea. **Drained:** Sept. 16. **LSD = A difference of 31 bu/A is required for one variety to differ from another at the 5% probability level. C.V. = 8.6%**

[2]Rough rice at 12% moisture.

[3]Winseedle chalk measurement.

[4]Days after emergence.

[5]Percent of plot that was lodged.

[6]Severity of lodging: 1 = plants totally erect, 5 = plants completely on ground.

[7]Weight of 1,000 kernels.

Table 9. Performance of rice varieties, hybrids, and experimental lines grown on Sharkey clay soil near Tunica, Mississippi (34°57'56"N, 90°29'88"W), 2021.[1]

Entry	Yield[2]	Whole milled rice	Total milled rice	Chalk[3]	Harvest moisture	Bushel weight	Plant height	50% heading[4]	Lodging[5]	Lodging score[6]	1,000 seed weight[7]
	bu/A	*%*	*%*	*%*	*%*	*lb*	*in*	*days*	*%*	*(1-5)*	*g*
					Hybrids						
RT7321	286	47.3	69.0	10.2	15.8	40.6	45.0	87	0	1	26.1
RT7401	265	58.2	69.7	7.2	18.2	40.4	42.0	87	0	1	23.8
RT7421	241	53.7	69.5	8.9	19.1	41.4	40.0	87	0	1	24.9
RT7521	266	51.3	67.2	7.1	11.9	39.9	42.0	89	0	1	23.8
RT7523 FP	280	52.7	68.1	7.8	14.1	39.3	41.8	91	0	1	25.9
					Clearfield/Provisia						
CL153	199	53.7	69.7	3.7	18.1	42.9	36.8	88	0	1	25.7
CL163	214	55.4	67.2	13.1	16.4	42.6	39.5	89	0	1	26.2
CLL15	203	59.3	69.1	3.5	17.1	42.3	36.3	91	0	1	24.3
CLL16	232	52.4	65.8	4.2	20.9	43.5	38.5	93	0	1	24.5
CLL17	232	59.5	68.2	6.3	18.2	42.7	37.3	91	0	1	23.9
CLX54197	226	59.1	68.5	9.1	19.1	44.7	36.0	92	0	1	23.9
PVL02	205	66.1	71.8	6.6	17.9	43.0	40.3	90	0	1	21.6
RU1804147	215	60.2	68.9	8.1	20.5	44.8	37.3	89	0	1	26.9
RU2004191	180	51.9	67.1	3.8	19.3	42.7	35.3	92	0	1	27.0
RU2004187	215	60.3	67.8	5.8	21.9	43.9	39.3	92	0	1	25.8
RU2004195	188	56.8	66.9	10.3	21.6	45.1	35.5	89	0	1	27.2
RU2004071	187	52.1	66.0	6.5	25.9	42.7	38.5	91	0	1	22.5
RU2004224	182	64.1	70.1	2.6	20.0	43.6	38.0	92	0	1	23.4
RU2104135	177	50.8	69.2	5.3	24.9	45.6	38.3	91	0	1	24.2
RU2104139	200	55.2	66.3	12.3	20.5	42.6	39.8	90	0	1	25.6
RU2104087	234	45.8	64.5	8.9	16.0	41.3	40.5	90	0	1	27.3
					Conventional						
Cheniere	205	59.6	70.8	4.0	19.4	42.5	34.0	88	0	1	21.5
Diamond	232	53.6	69.4	2.2	17.9	43.8	41.8	91	0	1	25.1
Rex	226	54.7	65.9	4.9	17.8	43.1	36.8	89	0	1	26.7
Thad	244	53.7	67.7	4.7	17.3	45.6	38.3	89	0	1	23.8
RU2004091	270	49.9	67.6	5.1	16.1	43.1	41.0	91	0	1	25.1
RU1904139	233	58.3	68.2	9.8	21.4	41.9	39.5	93	0	1	24.3
RU1904163	229	42.9	65.6	5.5	17.2	42.2	35.0	91	0	1	23.5
RU2004099	211	55.9	69.1	5.3	19.9	44.0	39.8	91	0	1	22.1
RU1904155	239	47.0	67.7	7.4	18.1	43.5	38.0	91	0	1	25.0
RU2004083	184	54.7	67.7	6.8	29.6	41.5	41.5	92	0	1	19.7
RU1904123	227	55.5	68.2	6.4	19.6	44.1	40.3	90	0	1	24.7
RU2104075	242	47.4	68.3	4.7	15.7	43.6	41.5	89	0	1	27.5
RU2104099	194	58.5	69.6	3.3	27.3	40.9	45.0	90	0	1	24.8

[1]**Planting date:** April 6. **Emergence:** April 22. **Harvested:** Aug. 28. **Management:** (sprayed) May 6 – Regiment @ 0.67 oz/A, Triple Play @ 1%, Prowl H2O @ 2 pt/A; July 21 – Grizzly II @ 1.8 oz/A; (fertilizer) April 28 – 50% DAP and 50% Ammonia Sulfate @ 100 lb/A; May 7 – Urea @ 260 lb/A; June 30 – Urea @ 100 lb/A. **Flooded:** May 8. **Drained:** Aug. 11. **LSD = A difference of 42 bu/A is required for one variety to differ from another at the 5% probability level. C.V. = 11.6%**

[2]Rough rice at 12% moisture.

[3]Winseedle chalk measurement.

[4]Days after emergence.

[5]Percent of plot that was lodged.

[6]Severity of lodging: 1 = plants totally erect, 5 = plants completely on ground.

[7]Weight of 1,000 kernels.

Table 10. Average rough rice yields of varieties, hybrids, and experimental lines evaluated in on-farm trials at seven locations, 2021.

Entry	Choctaw	Clarksdale	Hollandale	Pace	Shaw	Stoneville	Tunica	Avg.	Stability[1]
	bu/A	bu/A	bu/A	bu/A	bu/A	bu/A	bu/A	bu/A	
				Hybrids					
RT7321	197	324	270	286	328	202	286	270	20
RT7401	225	316	311	298	316	311	265	292	12
RT7421	229	320	308	302	323	299	241	289	13
RT7521	253	306	317	283	322	297	266	292	9
RT7523 FP	243	311	326	269	304	303	280	291	10
				Clearfield/Provisia					
CL153	230	260	237	235	246	213	199	231	8
CL163	184	247	251	215	228	232	214	224	9
CLL15	207	211	227	218	230	214	203	216	4
CLL16	233	261	299	267	277	237	232	258	9
CLL17	182	274	235	208	242	161	232	219	16
CLX54197	229	276	248	237	287	238	226	249	9
PVL02	125	232	147	176	198	94	205	168	27
RU1804147	217	288	295	241	276	150	215	240	20
RU2004191	208	275	285	261	259	216	180	241	15
RU2004187	199	267	257	258	267	214	215	240	11
RU2004195	224	292	268	251	259	204	188	241	14
RU2004071	217	289	300	261	276	233	187	252	15
RU2004224	195	252	236	243	232	196	182	220	12
RU2104135	204	247	266	219	229	175	177	217	15
RU2104139	132	184	231	177	177	105	200	172	23
RU2104087	232	292	298	245	290	227	234	260	11
				Conventional					
Cheniere	214	250	172	219	242	204	205	215	11
Diamond	226	299	269	246	283	246	232	257	10
Rex	227	274	272	255	254	231	226	249	8
Thad	187	280	246	254	282	230	244	246	12
RU2004091	249	295	283	270	283	238	270	270	7
RU1904139	215	292	295	262	273	250	233	260	11
RU1904163	247	295	258	246	290	240	229	258	9
RU2004099	229	280	250	229	267	229	211	242	9
RU1904155	223	278	280	261	271	242	239	256	8
RU2004083	233	284	257	253	282	267	184	251	13
RU1904123	227	262	233	275	248	239	227	244	7
RU2104075	238	299	228	281	262	238	242	255	9
RU2104099	234	294	286	243	292	248	194	256	13
Mean	215	277	263	248	267	224	222	245	
LSD	21	29	36	43	26	31	42		
CV	5.8%	6.4%	8.4%	8.5%	5.9%	8.6%	11.6%		
Planting Date	April 19	April 20	April 5	April 7	April 19	April 28	April 6		
Emergence date	May 2	May 2	April 22	April 22	May 2	May 9	April 22		

[1]Stability is calculated by dividing the standard deviation by the mean and multiplying by 100. The lower the number, the more stable it is across multiple locations.

Table 11. Average agronomic and milling performance of varieties, hybrids, and experimental lines grown at seven locations in Mississippi, 2021.

Entry	Origin[1]	Yield[2]	Whole milled rice	Total milled rice	Chalk[3]	Harvest moisture	Bushel weight	Plant height	50% heading[4]	Lodging[5]	Lodging[6]	1,000 seed weight[7]	Approximate seeds/pound
		bu/A	*%*	*%*	*%*	*%*	*lb*	*in*	*days*	*%*	*(1-5)*	*g*	*no*
Hybrids													
RT7321	RT	270	49.6	69.4	8.0	11.9	41.9	47	83	19	2	25.3	17945
RT7401	RT	291	55.2	70.1	6.5	12.4	41.9	45	83	5	1	24.5	18498
RT7421	RT	288	53.9	69.7	9.3	12.5	42.4	43	84	9	1	24.6	18445
RT7521	RT	292	55.7	68.1	6.9	11.9	40.7	47	84	11	1	23.9	18996
RT7523 FP	RT	292	54.4	68.7	5.4	11.4	40.7	46	86	2	1	25.6	17724
Clearfield/Provisia													
CL153	HA	231	58.7	70.7	3.9	13.0	43.9	40	84	0	1	25.1	18067
CL163	HA	225	58.4	68.8	10.3	13.9	43.3	42	86	25	2	23.5	19319
CLL15	HA	215	61.3	69.8	4.3	13.5	42.6	39	85	12	1	22.6	20050
CLL16	HA	257	54.9	67.6	5.0	15.7	44.8	42	86	1	1	23.7	19122
CLL17	HA	220	61.4	69.2	5.4	13.4	43.0	40	86	39	2	21.6	21032
CLX54197	HA	249	59.8	69.2	8.5	13.0	45.4	38	86	6	1	23.0	19776
PVL02	HA	167	64.5	71.9	5.4	14.2	43.2	42	85	55	3	20.3	22365
RU1804147	MS	240	62.3	69.6	8.1	13.2	45.2	42	86	4	1	26.1	17414
RU2004191	MS	240	58.3	68.7	4.8	12.5	43.8	40	86	0	1	25.9	17500
RU2004187	MS	239	60.7	68.8	5.4	14.1	44.7	44	87	0	1	24.1	18805
RU2004195	MS	240	59.5	68.6	7.7	14.2	45.2	42	85	2	1	25.6	17724
RU2004071	MS	251	57.7	68.9	5.5	17.6	44.2	41	87	0	1	23.6	19272
RU2004224	MS	218	64.2	70.4	3.3	14.3	43.7	41	86	6	1	22.4	20281
RU2104135	MS	216	52.5	69.8	3.9	16.9	45.9	43	87	10	1	23.1	19617
RU2104139	MS	172	57.3	68.0	8.7	18.3	43.6	45	86	56	3	23.0	19751
RU2104087	MS	260	53.5	66.8	8.2	11.2	42.8	43	86	6	1	25.9	17500
CL Mean		228	59.1	69.2	6.2	14.3	44.1	42	86	14	1	23.7	19225
Conventional													
Cheniere	LA	215	62.3	71.8	4.2	14.0	43.0	37	85	14	1	20.2	22507
Diamond	AR	258	56.5	70.1	2.8	14.1	44.9	45	87	7	1	25.3	17945
Rex	MS	248	58.8	67.8	6.1	12.6	43.8	42	86	6	1	25.7	17675
Thad	MS	245	58.3	68.5	6.3	14.9	45.4	41	86	13	1	23.6	19249
RU2004091	MS	270	50.7	68.5	8.6	14.1	43.5	43	87	9	1	24.7	18402
RU1904139	MS	260	59.6	68.0	10.3	14.9	43.8	42	88	0	1	23.7	19156
RU1904163	MS	258	47.6	67.6	7.0	12.8	43.2	38	87	7	1	22.7	20038
RU2004099	MS	243	58.1	69.9	5.3	15.1	45.5	42	88	6	1	22.1	20503
RU1904155	MS	256	53.0	68.2	8.2	12.4	45.0	42	87	0	1	23.6	19214
RU2004083	MS	251	59.2	69.7	5.9	15.6	44.9	44	87	7	1	21.9	20758
RU1904123	MS	243	55.9	68.1	7.0	13.0	45.5	41	86	7	1	24.9	18254
RU2104075	MS	254	52.5	69.1	5.6	11.5	44.0	43	84	16	2	25.2	18006
RU2104099	MS	256	57.2	69.7	5.0	14.4	42.5	44	87	0	1	23.3	19449
Mean		245	57	69	6	14	44	42	86	11	1	24	19128
LSD		21.7	4.3	1.0	1.5	2.8	0.7	2.1	3.3				
CV		14.6	7.6	2.0	32.3	33.2	2.1	6.8	5.2				

[1]AR = Arkansas; LA = Louisiana; MS = Mississippi; TX = Texas; HA = Horizon Ag, in conjunction with the respective state; RT = RiceTec Inc.
[2]Rough rice at 12% moisture.
[3]Winseedle chalk measurement.
[4]Days after emergence.
[5]Percent of plot that was lodged.
[6]Severity of lodging: 1 = plants totally erect, 5 = plants completely on ground.
[7]Weight of 1,000 kernels.

Table 12. Average agronomic and milling performance of varieties and hybrids grown at 21 on-farm locations from 2019–21.[1]

Entry	Origin[2]	Yield[3]	Whole milled rice	Total milled rice	Chalk	Bushel weight	Plant height	50% heading[4]	Lodging[5]	Lodging score[6]	1,000 seed weight[7]	Approx. seeds/ pound
		bu/A	*%*	*%*	*%*	*lb*	*in*	*days*	*%*	*(1-5)*	*g*	*no.*
						Conventional						
Cheniere	LA	217	60.6	72.3	4.6	42.6	37	85	10	1	21.9	21434
Diamond	AR	253	54.0	70.2	3.5	44.4	44	87	3	1	27.6	16685
Rex	MS	247	59.0	68.4	6.8	43.4	41	85	2	1	27.8	16620
Thad	MS	248	55.1	68.8	4.9	45.1	40	86	5	1	25.5	18023
						Clearfield						
CLL15	HA	233	58	70	6.3	42.2	37	84	8	1	24.7	18992
CL163	MS-HA	229	58	69	8.8	42.6	40	85	18	2	25.4	18261
CL153	LA-HA	232	58	71	4.3	43.2	39	84	1	1	25.5	18106

[1]Data presented are the averages of 21 total sites that served as the On-Farm Variety Trials for 2019–21. Listed entries were included in all 3 years.
[2]AR = Arkansas; LA = Louisiana; MS = Mississippi; TX = Texas; HA = Horizon Ag, in conjunction with the respective state; RT = RiceTec Inc.
[3]Rough rice at 12% moisture.
[4]Days after emergence.
[5]Percent of plot that was lodged.
[6]Severity of lodging: 1 = plants totally erect, 5 = plants completely on ground.
[7]Weight of 1,000 kernels.

Table 13. Reactions of rice varieties and hybrids to common diseases in the Midsouth.[1]

Variety/ Hybrid	Sheath blight	Blast	Stem rot	Kernel smut	False smut	Brown leaf spot	Straight head	Lodging	Black sheath rot	Bacterial panicle blight	Narrow brown leaf spot	Leaf smut
Bowman	MS	S	S	S	S	R	MS	MS	MS	S	MR	—
Cheniere	S	S	S	S	S	MR	MR	MS	MS	MS	VS	MR
CL111	VS	S	VS	S	S	R	MS	S	S	S	S	
CL142-AR	MS	S	S	S	S	R	MS	MS	S	S	MS	
CL151	S	VS	VS	S	S	R	VS	S	S	VS	S	—
CL152	S	MS			S		MR	MR		MS	R	
CL162	S	S	S	S	S	—	MR	VS	S	MR	R	—
CL261	MS	MS	S	MS	S	R	S	MR	MS	S	S	
CLXL729	MS	MR	MS	MS	S	R	MR	S	MS	MR	MS	—
CLXL745	MS	MR	MS	MS	S	R	MR	S	MS	MR	MS	—
Cocodrie	S	S	S	S	S	MR	VS	MS	MS	VS	MS	MS
Mermentau	S	S					MS			MS		
Rex	S	VS					MR	MR		VS	VS	
RoyJ	MS	S	S	VS	S	MR	S	MR	MS	S	MR	
Sabine	S	S	S	S	S	R	—	MR	S	S	MS	—
Taggart	MS	S	S	S	S	—	—	MS	S	S	—	—
Templeton	MS	R	S	S	S	—	—	MS	S	S	—	—
Wells	S	S	S	MS	S	MR	MR	S	—	VS	R	—
XL723	MS	MR	MS	MS	S	R	MR	S	MS	MR	MS	—
XL753	R	MR								MR		

[1]Abbreviations: R = resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible, VS = very susceptible. Note: These ratings are subject to change as new or further information may become available.

Table 14. Nitrogen fertilizer rate guidelines for selected rice varieties.

Varieties	Clay soils[1]		Silt loam soils[2]	
	Preflood	Midseason	Preflood	Midseason
	lb/A	*lb/A*	*lb/A*	*lb/A*
Bowman	120-150	30-60	90-120	30-60
Cheniere	120-150	30-60	90-120	30-60
CL151[3]	90-135	0-45	90	45
CL152	120-150	45	120	45
CL153	120-150	30-60	90-120	30-60
CL163	120-150	45	120	45
CL172	120-150	30-60	90-120	30-60
Cocodrie	120-150	30-60	90-120	30-60
Diamond	120-150	30-60	90-120	30-60
Lakast	120-140	30-45	90-120	30-45
Mermentau	120-150	30-60	90-120	30-60
PVL01	120-150	30-60	90-120	30-60
PVL02[4]	120-150	30-60	90-120	30-60
Rex	120-150	45	120	45
Sabine	120-150	30-60	90-120	30-60
Thad	120-150	30-60	90-120	30-60

[1]Clay soils include soils with CEC greater than 20 $cmol_c\ kg^{-1}$.
[2]Silt loam soils include soils with CEC less than 20 $cmol_c\ kg^{-1}$.
[3]CL151 is highly prone to lodging.
[4]Limited data for both clay and silt loam soils. Recommendations are subject to change with further testing.

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