MISSISSIPPI RICE
VARIETY TRIALS, 2018

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MISSISSIPPI'S OFFICIAL VARIETY TRIALS

MISSISSIPPI STATE UNIVERSITY™
MS AGRICULTURAL AND
FORESTRY EXPERIMENT STATION

Mississippi Rice Variety Trials, 2018

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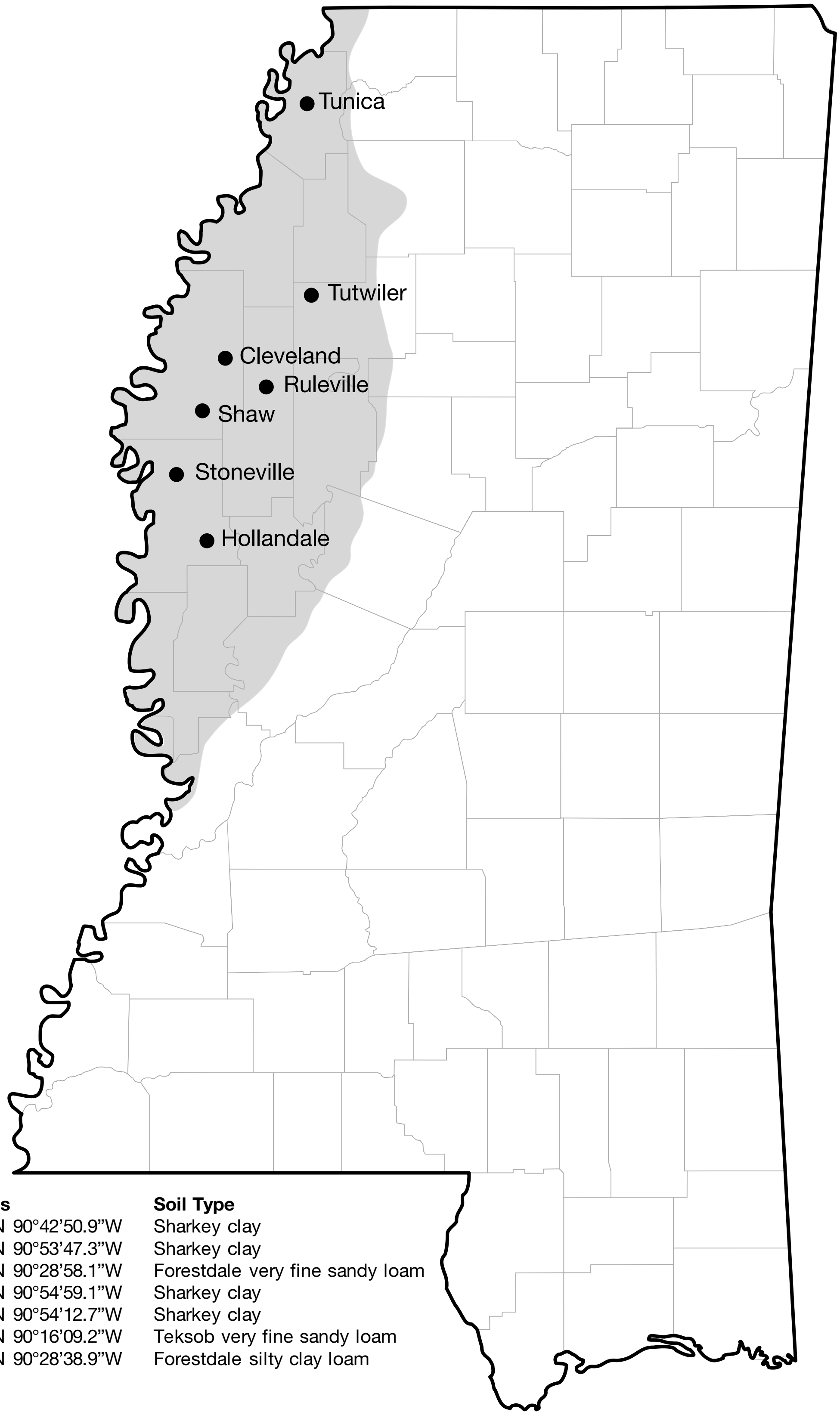
Find variety trial information online at ***mafes.msstate.edu/variety-trials***.



Location	Coordinates	Soil Type
Cleveland	33°46’34.1”N 90°42’50.9”W	Sharkey clay
Hollandale	33°09’00.5”N 90°53’47.3”W	Sharkey clay
Ruleville	33°43’13.5”N 90°28’58.1”W	Forestdale very fine sandy loam
Shaw	33°36’05.6”N 90°54’59.1”W	Sharkey clay
Stoneville	33°25’57.8”N 90°54’12.7”W	Sharkey clay
Tunica	34°34’40.7”N 90°16’09.2”W	Teksob very fine sandy loam
Tutwiler	34°00’27.9”N 90°28’38.9”W	Forestdale silty clay loam

Figure 1. Locations of the 2018 Rice On-Farm Variety Trials in the Mississippi Delta.

Mississippi Rice Variety Trials, 2018

INTRODUCTION

The United States Department of Agriculture (USDA) National Agricultural Statistics Service (NASS) in November 8, 2018, estimated the harvested rice area in Mississippi based on reports from rice producers to be about 139,000 acres. In November 2018, however, the USDA Farm Service Agency (FSA) certified the 2018 area planted to rice in the state to be 135,014 acres. The FSA estimate is about 21,014 acres or 18% more than the rice acreage in 2017 of 114,000 but still about 12% less than the average rice acreage (154,000) for the preceding 5 years (2013–2017, Table 1). Sixteen Mississippi counties produced the rice in the state during 2018 as certified by the FSA (Table 2).

In November 2018, NASS also forecasted the total rice production for Mississippi at 10.147 million hundredweight (515,491 metric tons), up 20% from the 2017 production of 8.436 million hundredweight (428,568 metric tons). At the November 2018 world rice price of $9.10 per hundredweight, the value of Mississippi rice production for 2018 is $92.3 million. Rice yield, on the other hand, was forecasted to be 7,300 pounds per acre (162 bushels per acre), down 100 pounds from 2017 and 204 pounds more than the running 10-year Mississippi average yield of 7,096 pounds (158 bushels). The record for statewide average yield, set in 2014, remains at 7,420 pounds per acre (165 bushels; 8,316 kilograms per hectare).

Table 1. USDA National Agricultural Statistics survey of harvested rice acreage in Mississippi (nearest thousand) by year, 1949–2018.

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	114,000
1958	39,000	1978	215,000	1998	268,000	2018	135,000
1959	44,000	1979	207,000	1999	323,000	2019	—
1960	44,000	1980	240,000	2000	218,000	2020	—
1961	44,000	1981	337,000	2001	253,000	2021	—
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	—

The leading rice producers were Bolivar County, 35,659 acres; Tunica County, 31,404 acres; Sunflower County, 12,458 acres; and Quitman County, 10,311 acres. The other 12 rice-producing counties had less than 10,000 acres planted. Bolivar, Tunica, and Quitman Counties were the top three rice producers in 2017. Eleven of the 16 rice-producing counties registered a net gain in acreage during 2018, with the highest gain of 7,228 acres in Bolivar County.

Planting progress was much slower in 2018 than in previous years. It proceeded slowly between the last few days of March and the second week of April, with 40% of the state's crop sown in by mid-April. This planting pace was behind the 3-, 5-, and 10-year historical averages. However, rice in most areas of the state was planted by the second week of May, resulting in most rice being planted on time. May had weather much like a normal June, with more average days above 90°F than observed in the recent past. This abnormally warm weather influenced many aspects of the crop. It influenced water management and herbicide performance more than it has in recent years.

The continually wet weather in early April hampered planting and, in some instances, early ground application of herbicides. The abnormal heat in May led to many fields being flushed multiple times and many postemergence herbicide applications having little activity, resulting in additional herbicide expense on much of the rice acres, especially those sown in late March to mid-April. In general, insect and disease pressures were average during most of the cropping season, with the exception of rice water weevil. In many areas, rice water weevil numbers were high. Disease was present in many fields, but severe disease pressure was observed only in a few isolated areas.

One of the greatest advantages of the 2018 growing season was the mild weather observed throughout the Midsouth during the traditional hot days of summer. When most of the rice was flowering, daytime temperatures hovered around 90°F, while nighttime temperatures were less than 72°F. These lower-than-normal temperatures resulted in excellent pollination and grain filling for most of Mississippi's rice crop. Low soybean prices should carry over to a limited increase in rice acres in Mississippi during 2019.

Table 2. USDA Farm Service Agency certified rice acres planted by county in Mississippi, 2009–2018.

County	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Adams	240	0	0	192	0	0	0	157	0	157
Attala	0	0	10	0	0	0	0	0	0	0
Bolivar	72,333	80,255	50,813	34,956	33,734	47,702	42,139	47,839	27,431	34,659
Carroll	205	0	0	0	0	0	0	0	0	0
Coahoma	14,761	25,032	11,370	8,797	8,109	14,453	9,933	12,885	7,788	9,970
DeSoto	859	1,156	335	553	1,190	2,316	99	1,896	1,261	1,605
Grenada	171	321	328	282	282	0	893	402	143	0
Holmes	1,485	1,448	234	141	121	203	195	655	0	1,036
Humphreys	3,656	8,241	1,996	1,955	1,475	3,426	2,576	5,695	3,874	4,264
Issaquena	783	2,702	880	890	1,115	483	345	764	427	435
Jackson	55	35	0	0	0	0	0	0	0	0
Lee	10	11	8	10	3	3	0	3	0	0
Leflore	17,107	20,144	6,754	5,328	3,905	6,000	5,059	7,734	1,770	5,035
Panola	4,777	6,446	5,383	5,901	5,523	10,188	5,966	9,668	8,458	7,343
Quitman	11,031	20,170	6,360	8,440	8,766	15,565	12,220	20,515	10,763	10,311
Sharkey	1,951	5,390	855	306	433	857	789	1,123	282	647
Sunflower	38,227	45,676	19,351	14,253	13,635	25,241	15,612	19,944	7,843	12,458
Tallahatchie	14,081	19,314	6,267	6,460	6,964	12,859	7,142	12,330	7,083	6,803
Tate	905	994	869	828	934	1,082	955	1,123	822	797
Tunica	23,913	27,041	23,167	21,696	24,603	28,608	25,833	34,812	27,286	31,403
Washington	29,507	35,736	18,854	14,687	11,480	15,690	13,027	12,135	8,442	8,091
Yazoo	1,841	1,907	2,273	765	0	867	914	1,571	893	0
Total	237,898	302,019	156,107	126,440	122,272	185,543	143,697	191,251	114,565	135014

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 and hybrids, new releases, and elite experimental lines to be evaluated in the environments where they are targeted for release. In the case of elite breeding lines, based on their performance in these multienvironment tests, the most promising are selected for possible release as new varieties. Information collected on these lines include yield and milling performance, insect and disease susceptibility, tolerance to environmental stresses, and 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 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 commonly used in commercial production in the state. Many of these growing conditions and management practices cannot be reproduced at MSU Delta Research and Extension Center in Stoneville, Mississippi, thus giving great value to the on-farm evaluations from the research and development perspective. In return, growers are afforded the opportunity to evaluate side by side the current varieties and hybrids in commercial circulation, 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 the chosen varieties or hybrids accordingly from the seed suppliers for the Mississippi rice industry.

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 becomes 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 "identity preserved" strategies that are gaining importance for improving overall rice grain quality. Rice researchers and Extension specialists can use the 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 not only from MSU, but also from other participating rice-breeding programs, including from the private industry.

TEST PROCEDURES

For 2018, the rice On-Farm Variety Trials consisted of 36 entries including five hybrids (three Clearfield® and two conventional types), 15 Clearfield® or Provisia® purelines (six released varieties and nine elite experimental lines) and 16 conventional purelines (eight released varieties and eight elite experimental lines). RiceTec provided all hybrids, while HorizonAg provided all Clearfield® and Provisia® purelines. Conventional pureline released varieties came from the public breeding programs of Mississippi (three), Arkansas (two), Louisiana (two), and Texas (one). The trials were conducted in seven locations from north to south in the Mississippi Delta, including Tunica, Tutwiler, Ruleville, Cleveland, Shaw, 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.** Readers who may be less familiar with pesticide formulations and application rates may wish to refer to pesticide product label information available on the Internet or to MSU Extension Service Publication 1532, "2019 Weed Control Guidelines for Mississippi" 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 small-plot combine equipped with a computerized weighing system and moisture meter. Due to differences in maturity, the majority 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 procedures were 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, and thus the level of precision of each test. Lower CV values indicate greater reliability of the test. CV 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 2019, preliminary results of the 2018 rice variety trials were immediately processed and made available online as early as November 2018 via the Mississippi Agricultural and Forestry Experiment Station Variety Trials website (***http://mafes.msstate.edu/variety-trials/includes/crops/rice.asp***). Hard copies of the preliminary results were also distributed to rice producers attending the Delta Rice Producers Meeting in Cleveland, Mississippi, on November 15, 2018.

Complete details on the performance of each entry at each of the seven test locations are presented in **Tables 3–9**. Unlike the past two years, when planting times spanned a narrow window of only 3 weeks, the 2018 trials were planted over a span of 7 weeks (March 26 to May 14) due to wet weather during this period. The Stoneville trial was the only trial planted 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 were leaf blast, panicle 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 at all locations for a few entries, with the most occurring in Shaw (23 entries). Five entries lodged in Hollandale, four in Cleveland and Tunica, two in Stoneville and Tutwiler, and one in Ruleville. Thirteen entries (four Clearfield® and nine conventional purelines) did not lodge in any of the locations. Eight were experimental lines, while five were released varieties (CL172, PVL01, Mermentau, Rex, Sabine, and Thad). On the other hand, as in the previous years, significant black-bird damage occurred in Stoneville.

The average rice yield across entries and locations for the 2018 trials was 221 bushels per acre, down 7 bushels per acre from the 2017 average of 228 bushels per acre and 4 bushels more than the running 10-year variety trial overall yield average (2008-2017) of 217 bushels. However, this amount was still 21 bushels less than the highest recorded average trial yield of 242 bushels 2014. This yield trend in the trials closely mirrors Mississippi statewide yield trends based on the NASS data.

Location yield averages ranged from 179 bushels per acre for Stoneville to 281 bushels per acre for Tutwiler. Cleveland (250 bushels) and Tunica (231 bushels) were the second and third highest-yielding sites, respectively, while Shaw (195 bushels)—where significant lodging occurred—was the second lowest. Stoneville was also the lowest-yielding location in 2016 and 2017 at 140 and 150 bushels per acre, respectively.

The CV values for yield ranged from 7.4% (Stoneville and Tutwiler) to 25.5% (Shaw). The rather high value obtained in Shaw could have resulted from significant lodging; 23 of 32 entries had an average of 60% lodging.

Total milling yields tended to be normal for most entries, but substantial differences among the trial entries were observed for whole milled rice, with the Hollandale site giving the lowest values. 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 entries, the conventional hybrid rice XP753 developed by RiceTec Inc. (previously designated in Mississippi variety trial reports as XL753) again topped the tests, also across all entries, with an average yield across locations of 297 bushels per acre. This hybrid has been the highest-yielding entry in variety trials of the past 5 years with average yields of 296 bushels per acre in 2017, 274 bushels in 2016, 275 bushels in 2015, 306 bushels in 2014, and 278 bushels in 2013. Its yield superiority over other hybrids and conventional pureline entries, both released and experimental, has been consistent over the years.

Following XP753 in terms of yield performance at 290 bushels per acre was Gemini 214 CL, a Clearfield® hybrid that was tested in 2016 (second highest yield of 272 bushels per acre) but not in 2017. RT 7311CL, another Clearfield® hybrid, was the third-highest-yielding entry at 277 bushels per acre; this entry had an average yield of 285 bushels per acre across locations in 2017.

Historically, hybrids have yielded, on average, about 21% (46 bushels per acre) higher than pure line varieties, both for Clearfield® and conventional types, in Mississippi rice variety trials. Considering the fact that the plot border effect is greater on hybrids as compared to purelines, the actual field yield differences may be expected to be closer when comparing the highest-yielding hybrid to the highest-yielding purelines.

Among the 15 Clearfield®/Provisia® pureline entries, the top six were all experimental breeding lines still under development: RU1604197 and 17CLST022 (both at 230 bushels per acre), RU1504197 (226 bushels), RU1704122 (224 bushels), RU1704055 (220 bushels), and RU1704198 (220 bushels). RU1704055 was the highest yielding among all Clearfield® entries in 2017 (231 bushels). The highest-yielding Clearfield® released variety was CL153 at 220 bushels per acre—10 bushels (5%) less than the top-yielding entry for this varietal type. CL153 was also the highest-yielding Clearfield® released variety entry (223 bushels) in 2017.

Among conventional purelines, the top-yielding entry was the experimental line RU1704077 with 228 bushels per acre. It was followed closely by two experimental lines (RU1604193 and 17CVST004) and two released varieties (Lakast and Rex) that all yielded 227 bushels per acre (Table 10). RU1704077 was also among the highest-yielding entries in the 2017 test (tied with Rex at 227 bushels).

The top-yielding entry in 2017 (Diamond) ranked only ninth of 16 entries in this year's trials, with 220 bushels per acre, followed by Thad (the second-highest-yielding in 2017) at 216 bushels this year. Diamond and Thad were also the top two highest-yielding conventional pureline entries in 2016. Lakast, on the other hand, which tied for second-highest yield this year was also second-highest yielding in 2017 (tied with Thad at 233 bushels per acre last year). Rex, the most popular conventional pureline variety in Mississippi, which was the fifth-highest yielding in 2017, performed well this year (tied for second along with Lakast and two breeding lines at 227 bushels).

Entries that begin with RU, 17CV, 17HA, and 17CL 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 (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. RU140**4**122).

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 the average yield performance in 21 trials conducted during the past 3 years (2016, 2017, and 2018) where all the above-mentioned, top-yielding conventional varieties were entered, Diamond had the highest yield at 228 bushels per acre, followed by Thad and Lakast (tied at 223 bushels) and Rex (222 bushels). In comparison, Mermentau, a variety from Louisiana that was previously popular among Mississippi producers, yielded an average of 199 bushels per acre in these trials. The Texas-bred variety Sabine, which is used in the rice-processing industry, yielded only 176 bushels per acre or about 47 bushels (21%) less than Thad, a comparable variety.

Among the Clearfield® released varieties, the best performer during the past 3 years (2016, 2017, 2018) has been CL153. However, several breeding lines still under development have consistently outyielded CL153 during this period. For example, among Clearfield® experimental lines that outyielded all other released Clearfield® varieties in 2018 is RU1504197 (ranked third at 226 bushels per acre). This line also performed well in 2017 (223 bushels) and in 2016 (197 bushels), outyielding all released Clearfield® varieties included in the tests during both years. Another promising line with similar performance during the period is RU1504083, which yielded very close to CL153 in 2018 at 218 bushels. RU1504083 has the typical Southern long-grain rice chemistry profile of intermediate amylose content, while RU1504197 is similar to Thad and CL163 in terms of having high amylose content, but it is similar to the formerly popular variety Cheniere in terms of cooking quality. The potential release of these two elite breeding lines is still being explored based on their performance in other tests for traits such as grain quality.

Substantial variation was observed among the test entries for the milling traits, and several high-yielding entries did not necessarily have the best grain quality characteristics. Aside from these trait considerations for variety selection, performance stability over many environments and years also needs to be considered. Varieties such as Cocodrie and Cheniere have been relatively stable over many years and thus have been popular varieties in Mississippi and the Midsouth in the past. Rex, on the other hand, has also shown good 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 multi-year, 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 of nitrogen per acre less than fine-textured or clay soils. By applying less N on silt loam soils, disease and lodging incidence are subject to decrease without sacrificing yield and quality.

Based on this year's variety trials results and taking into consideration previous years' performance, the conventional varieties suggested for Mississippi rice growers are Diamond, Thad, Lakast, and Rex. The conventional varieties Cheniere, Bowman, and Mermentau have not performed as well, though they have done well in Mississippi in the past. Sabine is often grown on limited acreage by contract, primarily due to its high amylose content and related cereal chemistry characteristics desired by the rice-processing industry. The recent release of Thad and CL163, both high-amylose varieties with excellent grain qualities, provides more varietal options to the U.S. rice-processing industry, as well as U.S. rice export markets requiring high-amylose rice.

For conventional hybrid rice production, XP753 remains the best option. For growers who need to utilize the Clearfield® technology to control red rice, Gemini 214 CL is the best option based on this year's variety trial results, although RT 7311CL, also offered by RiceTec Inc., performed well in 2017. Detailed additional information for the production of both conventional and Clearfield® hybrid rice is available at RiceTec.

Among Clearfield® pureline released varieties, offered exclusively by HorizonAg, CL153 was the best performer this year and was also the best-performing, long-grain Clearfield® pureline type in both 2017 and 2016. Other long-grain options include CL111, CL151, CL172, and CL163, also based on 2017 and 2016 variety trial data. Seed costs for Clearfield® rice have increased in recent years.

Clearfield® rice should be used as a tool with careful attention given to stewardship so 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 must 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® variety PVL01 promises to be a useful companion technology to extend the usefulness of Clearfield® rice system for controlling red rice.

As is well known to rice producers, no pureline variety or hybrid is perfect for all cropping conditions at all times. 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 take into account 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 provides 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, both Clearfield® and conventional types may help mitigate the risks associated with rice production in large production areas such as commonly found in Mississippi.

Table 3. Performance of rice varieties, hybrids, and experimental lines grown on Sharkey clay soil near Cleveland, Mississippi (33°46'34.1"N, 90°42'50.9"W), 2018.[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											
CL XL745	235	59.4	69.5	13.3	12.6	12.3	47.3	77	85	4	27.5
RT7311 CL	325	59.4	69.9	13.2	13.0	12.9	46.5	81	40	2	27.0
XP753	362	61.2	70.7	12.2	12.6	12.8	44.8	80	0	1	28.5
Gemini 214 CL	341	60.2	69.3	7.4	13.1	13.0	48.5	84	0	1	25.5
RT7801	240	50.9	67.4	8.8	22.1	13.8	44.5	90	0	1	30.5
Clearfield											
CL111	255	59.8	69.5	10.9	12.6	12.7	42.8	78	0	1	26.5
CL151	168	61.7	69.8	16.4	18.8	12.8	40.3	82	45	3	25.5
CL153	269	61.2	69.4	5.2	13.6	12.3	41.0	84	0	1	26.5
CL163	229	57.2	67.8	7.3	13.4	12.9	42.0	84	0	1	26.5
CL172	220	58.3	68.6	8.8	17.4	13.0	41.8	86	0	1	26.5
PVL01	229	54.1	68.9	11.8	15.6	13.1	39.3	88	0	1	26.0
RU1504083	259	55.2	67.7	10.1	13.0	12.9	39.3	80	0	1	26.5
RU1504197	258	55.1	66.0	13.1	13.2	13.0	40.8	82	0	1	23.0
RU1604197	219	51.9	65.5	8.8	21.5	13.7	44.8	88	0	1	27.0
RU1704055	227	51.8	66.9	11.1	18.2	13.2	41.0	85	0	1	30.0
RU1704122	271	54.5	68.3	8.7	12.7	12.9	41.3	80	0	1	27.5
RU1704154	229	56.3	67.1	13.4	15.6	13.1	41.8	85	0	1	26.5
RU1704196	160	55.7	68.3	10.6	16.8	12.4	43.3	82	70	3	26.0
RU1704198	259	57.1	66.9	12.5	13.3	12.8	39.8	82	0	1	24.5
17CLST022	244	56.9	67.6	13.8	16.4	13.5	41.3	84	0	1	26.0
Conventional											
Bowman	220	56.6	67.1	6.0	19.5	13.1	39.8	86	0	1	28.0
Cheniere	207	62.2	71.2	7.9	12.7	12.7	38.5	82	0	1	23.5
Diamond	254	57.5	68.1	9.7	14.9	13.2	46.0	84	0	1	28.5
LaKast	291	59.0	69.6	8.0	12.3	12.3	46.5	80	0	1	28.5
Mermentau	246	62.8	70.2	13.8	15.5	12.8	40.8	81	0	1	24.5
Rex	260	58.9	67.3	10.9	14.5	13.1	45.0	82	0	1	28.5
Sabine	230	62.7	69.9	9.8	14.2	12.9	42.5	82	0	1	25.5
Thad	244	60.0	68.2	6.8	16.4	13.2	41.0	84	0	1	28.0
RU1604193	275	61.2	69.9	9.0	15.7	13.0	46.5	85	0	1	25.0
RU1704077	261	55.1	65.6	7.2	15.9	13.2	44.8	82	0	1	27.5
RU1704114	215	60.8	69.4	6.6	12.9	12.3	41.0	80	0	1	26.5
RU1704157	265	60.6	70.2	9.8	12.9	12.9	41.8	82	0	1	25.5
17HAST008	258	57.8	67.1	13.5	12.6	12.7	39.3	79	0	1	27.5
17HAST009	260	55.1	65.6	8.8	13.3	12.7	39.5	82	0	1	27.0
17CVST010	270	61.1	69.7	16.5	13.4	12.9	41.5	86	0	1	25.5
17CVST004	258	58.9	68.5	9.6	12.6	12.3	37.8	81	0	1	26.0

[1]**Planting date**: April 21. **Emergence**: May 2. **Herbicides**: 40 oz/A Gramoxone, 2 oz/A Sharpen, and 0.25% v/v Adspray 80/20 on March 17; 32 oz/A Facet L, 0.67 oz/A Permit, and 0.25% v/v Adspray 80/20 on May 20; 15 oz/A Clincher and 1 qt/A crop oil on June 20. **Fertilizer**: 200 lb/A urea on June 11; 100 lb/A on June 21; and 100 lb/A on July 24. **Flood date**: June 11. **Harvested**: August 29. LSD = A difference of 43 bu/A is required for one variety to differ from another at the 5% probability level. C.V. = 10.5%.

[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 4. Performance of rice varieties, hybrids, and experimental lines grown on Sharkey clay soil near Hollandale, Mississippi (33°09'00.5"N, 90°53'47.3"W), 2018.[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											
CL XL745	203	36.5	69.3	8.0	11.2	40.1	40.5	81	90	2	16.6
RT7311 CL	223	31.8	68.9	14.0	11.1	39.8	40.3	81	0	1	18.2
XP753	256	29.7	70.0	8.6	11.1	41.2	41.0	81	0	1	20.9
Gemini 214 CL	255	39.5	66.6	7.1	10.7	39.7	39.0	85	0	1	20.7
RT7801	246	32.6	67.5	7.6	10.9	38.4	41.5	87	95	4	20.1
Clearfield											
CL111	164	36.5	69.7	9.6	11.1	42.8	35.5	79	0	1	13.4
CL151	175	32.9	67.4	13.7	11.1	40.2	37.8	81	45	2	14.3
CL153	215	42.3	68.4	5.1	11.5	41.4	34.5	81	0	1	17.6
CL163	190	43.8	66.5	11.1	10.8	39.9	37.5	88	0	1	15.5
CL172	203	44.8	68.1	4.1	11.4	42.3	38.0	84	0	1	16.6
PVL01	154	40.2	69.8	14.4	10.8	32.6	35.8	89	0	1	12.6
RU1504083	166	35.4	68.6	15.0	10.9	33.5	31.8	82	0	1	13.6
RU1504197	200	32.9	66.3	10.3	11.2	42.6	35.0	86	0	1	16.3
RU1604197	237	28.1	66.7	16.0	11.3	41.6	40.0	84	0	1	19.4
RU1704055	196	37.7	66.3	11.0	10.8	37.6	37.0	84	0	1	16.0
RU1704122	168	31.6	68.6	7.1	11.2	40.1	34.3	81	0	1	13.8
RU1704154	204	35.1	68.9	13.8	10.8	37.2	38.0	80	0	1	16.6
RU1704196	163	36.8	66.0	9.1	11.1	40.8	35.8	80	45	2	13.4
RU1704198	169	30.0	66.0	13.2	10.6	39.8	33.0	85	20	2	13.8
17CLST022	240	32.0	67.9	13.6	11.0	39.7	36.3	82	0	1	19.6
Conventional											
Bowman	195	34.3	66.6	5.7	11.0	42.3	36.8	88	0	1	15.9
Cheniere	157	44.5	70.5	6.6	11.4	39.0	32.0	84	0	1	12.8
Diamond	216	32.4	64.9	6.9	11.2	42.0	39.5	84	0	1	17.6
LaKast	223	34.7	67.6	3.9	11.2	42.7	38.8	84	0	1	18.2
Mermentau	190	52.6	68.1	8.4	11.0	41.2	35.8	87	0	1	15.5
Rex	231	46.1	65.8	8.7	11.3	43.1	38.5	84	0	1	18.9
Sabine	181	34.4	68.4	7.9	11.1	42.8	36.0	81	0	1	14.8
Thad	199	35.0	65.9	5.0	11.6	43.3	37.3	86	0	1	16.4
RU1604193	226	42.7	69.0	3.9	11.2	42.5	41.5	86	0	1	18.5
RU1704077	197	29.4	65.1	6.4	11.3	43.4	38.5	82	0	1	16.1
RU1704114	211	21.6	68.8	5.8	11.1	41.9	35.5	82	0	1	17.2
RU1704157	217	28.3	67.8	6.8	11.2	40.6	38.8	86	0	1	17.7
17HAST008	182	37.0	65.9	13.4	11.4	41.5	33.0	82	0	1	14.9
17HAST009	214	36.6	65.8	7.7	11.4	42.5	37.8	82	0	1	17.5
17CVST010	213	40.8	66.5	4.9	11.6	42.7	37.5	86	0	1	17.5
17CVST004	202	27.3	68.6	5.0	11.8	43.2	34.0	82	0	1	16.6

[1]**Planting date:** April 13. **Emergence:** April 26. **Harvested:** September 20. LSD = A difference of 24 bu/A is required for one variety to differ from another at the 5% probability level. C.V. = 14.8%.
[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 5. Performance of rice varieties, hybrids, and experimental lines grown on Forestdale very fine sandy loam soil near Ruleville, Mississippi (33°43'13.5"N, 90°28'58.1"W), 2018.[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											
CL XL745	231	48.0	70.0	11.1	11.2	40.6	40.5	76	0	1	28.5
RT7311 CL	293	42.5	68.5	12.9	11.3	40.4	42.3	76	0	1	25.0
XP753	293	42.0	69.8	17.7	11.6	41.5	41.5	76	0	1	25.0
Gemini 214 CL	285	45.7	68.6	13.0	11.6	40.4	42.5	77	0	1	25.0
RT7801	273	47.2	69.6	6.6	11.7	40.1	44.0	85	0	1	28.0
Clearfield											
CL111	187	48.9	70.1	9.8	11.9	43.2	36.5	77	0	1	27.0
CL151	192	49.0	70.2	15.7	12.0	42.9	37.5	81	0	1	25.5
CL153	185	52.6	69.7	9.1	11.7	43.1	36.0	81	0	1	25.5
CL163	195	52.7	67.9	16.8	11.9	42.7	39.5	79	40	2	25.0
CL172	184	54.3	69.8	5.9	11.9	43.6	36.0	78	0	1	26.0
PVL01	158	57.7	70.2	14.5	11.8	37.1	37.3	88	0	1	28.5
RU1504083	201	43.3	68.1	19.4	11.8	43.1	34.8	79	0	1	26.5
RU1504197	208	57.9	70.1	8.1	12.3	45.6	35.0	84	0	1	26.5
RU1604197	214	46.4	69.1	12.2	13.0	41.1	39.5	82	0	1	25.0
RU1704055	224	48.5	68.1	11.3	12.0	39.7	38.0	82	0	1	27.5
RU1704122	156	39.5	68.9	14.0	11.8	37.8	36.5	78	0	1	28.5
RU1704154	183	43.2	68.4	14.4	11.9	39.8	36.5	77	0	1	26.0
RU1704196	199	45.8	67.7	10.7	11.8	42.7	36.0	77	0	1	25.5
RU1704198	206	41.9	67.8	13.8	12.1	42.6	34.5	79	0	1	26.0
17CLST022	201	47.7	68.4	13.0	12.1	42.4	36.5	78	0	1	28.5
Conventional											
Bowman	178	57.4	69.7	4.4	12.3	44.7	37.0	83	0	1	26.5
Cheniere	172	61.5	72.3	10.6	11.4	42.4	34.8	80	0	1	24.0
Diamond	220	50.1	69.7	9.9	12.4	44.0	38.5	79	0	1	26.0
LaKast	197	47.1	69.0	9.5	11.9	43.4	38.8	82	0	1	29.5
Mermentau	174	58.7	70.2	20.0	11.9	43.1	39.3	78	0	1	26.0
Rex	204	52.9	67.3	9.3	12.0	43.4	37.0	82	0	1	29.5
Sabine	151	59.3	70.5	6.7	12.2	43.4	38.8	82	0	1	26.5
Thad	183	58.8	69.4	4.1	12.2	45.5	37.8	88	0	1	27.5
RU1604193	218	57.6	70.7	5.8	12.3	43.9	41.3	83	0	1	24.5
RU1704077	207	41.0	67.6	12.0	12.1	44.3	38.0	79	0	1	26.5
RU1704114	173	33.5	67.6	15.0	11.9	41.7	36.5	77	0	1	25.5
RU1704157	182	53.3	70.8	6.8	12.1	43.3	37.5	79	0	1	26.0
17HAST008	201	50.8	68.0	15.2	11.4	41.5	33.3	77	0	1	28.0
17HAST009	191	55.3	67.9	11.7	11.8	43.2	36.3	79	0	1	26.0
17CVST010	180	54.0	68.1	8.0	11.3	43.1	34.8	79	0	1	25.0
17CVST004	180	47.7	68.5	6.3	11.7	43.1	35.3	79	0	1	27.5

[1]**Planting date:** March 27. **Emergence:** April 17. **Herbicides:** 1 qt/A Roundup, 1 pt/A Command, and 1 qt/A Facet on March 31; 10 oz/A Command on April 18; 2.4 oz/A Grasp and 6/10 oz/A Halomax on May 10. **Fertilizer:** 50 lb/A DAP and 100 lb/A potash on April 19; 200 lb/A urea and Agrotain on May 10; 100 lb/A Am. sulfate on May 22; and 100 lb/A urea on June 1. **Insecticide:** 1 gal/70A Lambda on July 25. **Fungicide:** 17.5 oz/A Quilt on June 26. **Drained:** August 11. **Harvested:** August 28. LSD = A difference of 27 bu/A is required for one variety to differ from another at the 5% probability level. C.V. = 16.6%.

[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 6. Performance of rice varieties, hybrids, and experimental lines grown on Sharkey clay soil near Shaw, Mississippi (33°36'05.6"N, 90°54'59.1"W), 2018.[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											
CL XL745	177	44.6	72.2	10.4	11.8	39.1	45.8	84	95	4	14.6
RT7311 CL	217	46.2	70.4	11.9	11.5	40.0	45.3	86	90	4	17.8
XP753	233	41.4	71.5	7.9	11.8	41.0	46.3	85	90	4	19.2
Gemini 214 CL	209	47.3	70.0	7.0	11.6	38.7	47.5	87	77.5	4	17.2
RT7801	224	44.4	70.1	5.6	12.2	39.2	43.0	94	62.5	3	18.6
Clearfield											
CL111	157	49.8	69.9	8.3	11.9	41.8	42.8	87	88	4	12.9
CL151	146	44.6	69.6	11.2	11.5	40.9	40.8	87	83	4	12.0
CL153	170	56.4	70.3	4.0	12.4	41.3	40.0	88	38	2	14.1
CL163	160	48.9	68.5	7.7	11.6	35.4	42.3	91	83	4	13.1
CL172	223	57.5	70.4	4.0	12.4	42.7	39.8	91	0	1	18.5
PVL01	196	51.8	69.2	4.9	12.1	39.7	41.5	94	0	1	16.2
RU1504083	166	41.9	69.6	12.3	11.7	41.9	38.0	87	45	3	13.7
RU1504197	183	52.3	69.7	6.6	11.9	43.1	38.3	90	13	2	15.1
RU1604197	218	50.9	69.6	10.2	12.8	43.0	44.0	95	0	1	18.2
RU1704055	185	52.1	68.7	6.4	11.8	39.0	43.5	93	45	2	15.2
RU1704122	227	48.6	69.1	4.9	11.7	39.7	41.5	90	0	1	18.7
RU1704154	159	48.5	69.6	11.8	11.6	33.4	41.3	90	10	2	13.1
RU1704196	129	42.9	68.3	8.9	11.5	39.4	41.5	87	90	4	10.6
RU1704198	192	48.0	69.2	7.6	11.4	40.5	38.3	90	63	4	15.8
17CLST022	191	47.3	69.1	10.0	11.5	39.9	40.8	93	10	1	15.6
Conventional											
Bowman	225	52.4	69.5	3.0	12.2	43.9	38.5	95	0	1	18.6
Cheniere	132	49.6	71.9	5.3	12.1	36.5	39.0	88	100	4	10.9
Diamond	179	50.2	69.4	5.1	12.2	41.9	42.3	91	50	3	14.8
LaKast	162	48.2	68.8	4.3	12.2	42.5	46.3	91	88	4	13.4
Mermentau	211	57.5	69.7	8.2	12.3	41.5	42.0	87	0	1	17.5
Rex	234	54.4	68.3	8.9	11.9	41.6	44.0	90	0	1	19.3
Sabine	160	56.3	70.9	4.9	12.0	41.0	43.0	91	0	1	13.2
Thad	253	54.1	69.7	3.7	12.8	43.3	42.3	96	0	1	21.1
RU1604193	179	56.5	72.2	2.9	12.0	43.3	44.5	94	68	3	14.8
RU1704077	206	49.1	67.3	5.7	12.0	42.8	45.8	88	53	3	17.0
RU1704114	175	43.1	70.7	6.5	11.4	28.0	40.3	89	50	3	14.3
RU1704157	178	44.9	70.6	5.2	11.9	41.6	43.8	89	85	4	14.7
17HAST008	252	54.1	69.3	8.7	12.4	41.6	42.0	90	0	1	20.9
17HAST009	222	53.8	68.6	5.9	12.2	42.3	43.0	93	0	1	18.4
17CVST010	245	55.0	68.5	7.4	12.5	41.7	44.5	94	0	1	20.4
17CVST004	248	47.1	70.9	4.9	12.4	41.6	41.5	94	0	1	20.6

[1]**Planting date:** March 26. **Emergence:** April 16. **Harvested:** September 4. LSD = A difference of 41 bu/A is required for one variety to differ from another at the 5% probability level. C.V. = 25.5%.
[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 Sharkey clay soil near Stoneville, Mississippi (33°25'57.8"N, 90°54'12.7"W), 2018.[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											
CL XL745	186	40.8	69.2	13.9	11.3	10.7	41.8	79	45	2	32.5
RT7311 CL	185	32.8	67.7	21.0	11.2	10.5	40.3	84	37.5	2	28.5
XP753	220	27.7	69.3	17.7	11.3	10.5	41.5	84	0	1	29.5
Gemini 214 CL	231	45.8	68.5	8.1	11.6	10.3	42.5	84	0	1	29.5
RT7801	220	46.5	68.4	8.8	12.2	10.9	40.0	90	0	1	32.5
Clearfield											
CL111	172	46.3	70.2	21.8	11.7	10.2	36.8	78	0	1	32.0
CL151	185	44.8	69.9	19.1	11.6	10.6	38.5	84	0	1	29.0
CL153	165	49.5	70.6	11.9	12.0	10.6	35.0	82	0	1	29.5
CL163	183	56.1	69.2	16.3	11.9	10.3	40.5	91	0	1	31.5
CL172	162	54.9	69.9	6.3	12.2	10.3	36.3	86	0	1	30.0
PVL01	135	48.6	69.7	8.4	11.8	10.3	36.8	88	0	1	34.0
RU1504083	198	46.5	66.9	22.4	11.6	9.9	37.3	84	0	1	31.0
RU1504197	200	50.4	69.9	12.0	12.1	10.2	37.5	85	0	1	27.0
RU1604197	198	45.4	69.4	21.3	12.1	10.4	39.8	85	0	1	28.5
RU1704055	193	49.6	68.8	13.3	11.8	10.7	38.5	88	0	1	34.5
RU1704122	176	44.3	68.8	12.8	11.5	10.4	36.5	84	0	1	32.5
RU1704154	183	46.1	68.7	17.8	11.6	10.8	37.5	84	0	1	33.0
RU1704196	178	52.0	69.4	19.4	11.8	11.1	37.3	85	0	1	31.0
RU1704198	191	43.8	68.7	22.1	11.6	10.3	36.5	90	0	1	32.5
17CLST022	195	40.9	69.2	21.4	11.8	10.8	35.8	86	0	1	33.5
Conventional											
Bowman	166	56.7	69.3	5.7	12.2	10.4	37.5	92	0	1	31.0
Cheniere	161	55.3	72.7	4.5	11.7	10.4	37.3	84	0	1	31.0
Diamond	185	45.0	69.2	11.9	11.7	10.8	39.5	84	0	1	31.0
LaKast	181	41.3	69.3	6.5	11.8	10.7	40.3	84	0	1	32.5
Mermentau	159	58.1	69.4	9.1	11.9	10.4	37.5	79	0	1	30.5
Rex	160	54.9	67.4	13.3	12.2	11.1	37.0	86	0	1	35.5
Sabine	144	47.9	70.1	14.8	12.0	10.4	37.0	84	0	1	31.0
Thad	165	45.1	68.1	7.0	12.3	11.2	38.8	92	0	1	29.0
RU1604193	162	49.7	70.3	5.4	11.9	10.9	40.8	87	0	1	31.0
RU1704077	185	41.4	68.7	14.0	12.0	10.7	41.5	79	0	1	29.0
RU1704114	165	26.5	69.2	11.3	11.7	10.3	36.5	82	0	1	29.0
RU1704157	176	40.4	71.3	6.6	12.1	10.1	40.0	86	0	1	27.5
17HAST008	173	40.4	68.7	25.2	11.9	10.7	35.8	79	0	1	33.0
17HAST009	180	46.7	67.8	17.8	12.2	10.8	39.3	86	0	1	31.0
17CVST010	172	47.6	68.9	5.9	11.9	11.2	36.3	84	0	1	29.0
17CVST004	169	39.4	70.3	9.1	12.1	11.1	35.0	84	0	1	31.5

[1]**Planting date:** May 14. **Emergence:** May 21. **Herbicides:** Command at 1.3 pt/A on May 16; and RiceBeaux at 3 qt/A, Facet at 22 oz/A, and Herbivore at 1.3 oz/A on June 5. **Fertilizer:** Urea at 150 lb/A on July 2. **Insecticide:** N/A. **Fungicide:** N/A. **Harvested:** October 4. LSD = A difference of 22 bu/A is required for one variety to differ from another at the 5% probability level. C.V. = 7.4%.
[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 8. Performance of rice varieties, hybrids, and experimental lines grown on Teksob very fine sandy loam near Tunica, Mississippi (34°34’40.7”N, 90°16’09.2”W), 2018.[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											
CL XL745	316	57.5	69.9	8.4	12.0	38.0	47.3	68	0	1	25.5
RT7311 CL	342	57.5	69.4	12.6	12.1	38.1	46.0	68	0	1	24.5
XP753	335	56.6	70.2	11.0	11.9	39.9	45.8	68	0	1	24.0
Gemini 214 CL	328	58.9	68.0	5.0	12.2	38.0	48.0	71	0	1	25.0
RT7801	314	58.5	68.9	5.8	14.2	38.6	45.5	80	0	1	29.0
Clearfield											
CL111	212	55.4	66.7	9.4	11.6	38.6	42.0	74	30	2	27.5
CL151	195	58.5	68.2	9.3	12.6	37.5	42.3	74	58	4	25.0
CL153	238	56.7	65.6	6.0	12.2	38.6	40.3	75	0	1	25.0
CL163	209	56.3	66.0	7.3	12.3	39.6	40.5	79	0	1	25.5
CL172	196	53.0	63.5	5.5	12.2	38.4	40.3	77	0	1	23.5
PVL01	196	52.8	64.1	7.2	11.6	33.9	40.0	78	0	1	25.0
RU1504083	253	52.4	66.2	11.6	12.1	39.6	38.8	74	0	1	24.5
RU1504197	260	58.0	65.6	8.0	12.4	40.6	39.0	77	0	1	21.5
RU1604197	249	55.3	65.7	8.7	14.7	40.5	42.5	79	0	1	24.5
RU1704055	233	50.1	63.9	9.1	12.7	35.1	43.8	81	0	1	24.0
RU1704122	268	51.8	66.9	7.2	12.0	37.9	42.5	76	0	1	24.5
RU1704154	220	56.8	66.3	7.6	12.6	38.8	40.0	77	0	1	25.0
RU1704196	201	51.3	66.8	7.5	12.1	37.2	42.0	75	58	3	25.5
RU1704198	250	56.1	67.0	6.6	12.5	39.2	39.0	78	0	1	25.0
17CLST022	264	55.2	65.2	9.5	12.8	39.0	39.0	81	0	1	26.0
Conventional											
Bowman	152	58.0	66.3	3.6	13.7	39.8	36.3	82	0	1	26.5
Cheniere	190	59.7	69.5	6.7	12.3	39.3	38.0	79	0	1	23.5
Diamond	202	55.1	65.7	5.7	16.6	41.0	40.8	80	0	1	25.0
LaKast	230	54.9	66.6	5.1	12.7	41.9	39.8	80	0	1	26.5
Mermentau	207	56.7	66.1	10.1	12.8	39.4	38.5	77	0	1	24.5
Rex	219	56.7	65.5	6.7	12.5	40.7	40.3	77	0	1	27.0
Sabine	187	60.4	67.5	4.8	12.2	40.7	41.8	78	0	1	25.5
Thad	200	56.2	64.4	3.8	14.6	41.7	39.5	81	0	1	24.0
RU1604193	236	57.5	67.1	5.3	13.7	39.6	42.8	82	0	1	24.5
RU1704077	242	54.4	63.6	4.6	12.8	41.4	43.3	79	0	1	26.5
RU1704114	197	54.5	68.3	5.8	11.7	38.8	38.5	75	0	1	25.5
RU1704157	201	54.9	65.4	7.2	12.4	38.8	40.0	78	13	2	22.5
17HAST008	216	56.0	67.1	9.0	12.3	38.9	35.3	76	0	1	26.5
17HAST009	206	56.5	66.0	5.6	12.8	39.6	38.0	79	0	1	27.0
17CVST010	209	57.3	67.0	6.6	12.5	42.1	39.5	83	0	1	28.0
17CVST004	233	58.9	68.1	5.2	12.2	41.4	37.8	77	0	1	28.5

[1]**Planting date:** April 12. **Emergence:** April 28. **Herbicides:** 1 qt/A glyphosate, 1 gal/8A Command, 2 oz/A Sharpen on April 16; and 1 gal/A propanil, 10 oz/A Strada XT2, and 1 pt/A crop oil on May 9. **Fertilizer:** 292 lb/A of 41-0-0-4 on May 10; and 100 lb/A urea on June 20. **Insecticide:** 1 gal/35A Mustang Max on July 18. **Drained:** August 2. **Harvested:** August 28. LSD = A difference of 30 bu/A is required for one variety to differ from another at the 5% probability level. C.V. = 18.4%.
[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 9. Performance of rice varieties, hybrids, and experimental lines grown on Forestdale silty clay loam soil near Tutwiler, Mississippi (34°00'27.9"N, 90°28'38.9"W), 2018.[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											
CL XL745	311	60.8	71.1	9.0	12.2	40.5	44.0	69	37.5	2	27.5
RT7311 CL	353	58.3	70.8	12.4	12.2	40.1	43.8	69	0	1	26.0
XP753	381	60.9	71.8	14.4	12.0	41.0	45.3	69	0	1	26.5
Gemini 214 CL	383	60.1	70.6	8.9	12.0	40.5	45.5	73	0	1	26.0
RT7801	354	60.3	71.0	6.7	14.9	40.2	44.8	81	0	1	29.0
Clearfield											
CL111	288	63.6	71.1	6.0	12.2	43.1	42.5	71	0	1	23.8
CL151	277	62.8	70.9	9.9	12.5	43.8	42.0	73	0	1	23.0
CL153	295	64.8	71.2	6.0	13.0	42.7	42.0	77	0	1	24.6
CL163	258	61.5	69.9	10.1	13.0	42.1	42.5	81	0	1	21.6
CL172	238	64.0	71.2	4.6	13.6	43.5	40.0	78	0	1	20.0
PVL01	247	57.8	70.5	10.3	13.6	40.8	41.5	81	0	1	20.8
RU1504083	285	58.4	69.6	12.0	12.4	43.7	38.3	74	0	1	23.6
RU1504197	275	62.9	69.9	9.2	12.5	45.3	42.0	78	0	1	22.8
RU1604197	275	62.1	70.7	8.9	15.2	44.5	42.3	79	0	1	23.6
RU1704055	290	58.1	69.9	10.4	12.7	39.3	41.8	80	0	1	24.1
RU1704122	304	53.5	70.7	10.3	12.1	41.3	41.3	74	0	1	25.1
RU1704154	244	58.1	70.0	13.0	12.1	42.5	40.0	75	0	1	20.2
RU1704196	186	60.6	68.8	8.8	12.2	42.2	41.8	74	38	2	15.4
RU1704198	276	60.2	69.9	7.4	12.2	41.0	37.5	78	0	1	22.9
17CLST022	274	60.9	70.2	10.3	12.6	42.3	38.3	80	0	1	22.8
Conventional											
Bowman	227	63.7	70.9	5.4	13.4	44.6	39.0	81	0	1	19.0
Cheniere	247	66.1	73.4	6.9	12.7	43.4	40.0	80	0	1	20.6
Diamond	283	58.3	69.9	8.1	15.3	44.7	41.8	78	0	1	24.3
LaKast	306	56.9	70.6	6.9	12.5	44.4	44.8	75	0	1	25.4
Mermentau	253	64.3	71.1	15.7	14.2	43.3	40.0	76	0	1	21.5
Rex	278	60.5	69.2	8.6	12.5	44.0	40.5	77	0	1	23.1
Sabine	209	66.4	71.4	6.8	12.3	44.3	40.3	79	0	1	17.3
Thad	270	64.4	70.3	6.1	15.6	46.0	41.0	81	0	1	23.3
RU1604193	294	64.0	72.0	4.8	13.2	44.9	47.0	82	0	1	24.6
RU1704077	300	61.4	69.2	9.8	15.2	44.9	44.3	77	0	1	25.7
RU1704114	218	61.8	70.4	9.9	12.1	39.6	39.3	74	0	1	18.1
RU1704157	284	63.6	72.1	7.7	12.4	43.7	43.3	77	0	1	23.5
17HAST008	299	61.7	70.2	11.9	12.9	42.8	38.3	75	0	1	24.9
17HAST009	290	63.1	69.6	10.1	14.7	42.9	41.3	79	0	1	24.7
17CVST010	287	61.2	69.9	13.6	13.7	44.1	42.0	82	0	1	24.2
17CVST004	298	62.3	70.5	7.5	12.7	43.9	38.0	79	0	1	24.8

[1]**Planting date:** April 12. **Emergence:** April 28. **Herbicides:** 3 qt/A Ricebeaux, 32 oz/A Facet L, and 1 qt/A Prowl on May 11. **Fertilizer:** 100 lb/A MESZ on May 1; 100 lb/A treated urea on May 18; 100 lb/A treated urea on May 19; 100 lb/A urea on June 13; and 100 lb/A urea on June 20. **Insecticide:** 1 lb/70A of Karate Z on July 19. **Fungicide:** 16 oz/A Stratego on July 9. **Flood:** May 19. **Harvested:** August 30. LSD = A difference of 34 bu/A is required for one variety to differ from another at the 5% probability level. C.V. = 7.4%.

[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 10. Average rough rice yields of varieties, hybrids, and experimental lines evaluated in on-farm trials at seven locations, 2018.

Entry	Cleveland	Hollandale	Ruleville	Shaw	Stoneville	Tunica	Tutwiler	Average	Stability[1]
	bu/A	*bu/A*	*bu/A*	*bu/A*	*bu/A*	*bu/A*	*bu/A*	*bu/A*	
				Hybrids					
CL XL745	235	203	231	177	186	316	311	237	24
RT7311 CL	325	223	293	217	185	342	353	277	24
XP753	362	256	293	233	220	335	381	297	22
Gemini 214 CL	341	255	285	209	231	328	383	290	22
RT7801	240	246	273	224	220	314	354	267	19
				Clearfield					
CL111	255	164	187	157	172	212	288	205	23
CL151	168	175	192	146	185	195	277	191	20
CL153	269	215	185	170	165	238	295	220	21
CL163	229	190	195	160	183	209	258	203	15
CL172	220	203	184	223	162	196	238	204	12
PVL01	229	154	158	196	135	196	247	188	20
RU1504083	259	166	201	166	198	253	285	218	20
RU1504197	258	200	208	183	200	260	275	226	15
RU1604197	219	237	214	218	198	249	275	230	10
RU1704055	227	196	224	185	193	233	290	221	15
RU1704122	271	168	156	227	176	268	304	224	24
RU1704154	229	204	183	159	183	220	244	203	14
RU1704196	160	163	199	129	178	201	186	174	13
RU1704198	259	169	206	192	191	250	276	221	17
17CLST022	244	240	201	191	195	264	274	230	14
				Conventional					
Bowman	220	195	178	225	166	152	227	194	15
Cheniere	207	157	172	132	161	190	247	181	19
Diamond	254	216	220	179	185	202	283	220	16
LaKast	291	223	197	162	181	230	306	227	22
Mermentau	246	190	174	211	159	207	253	205	16
Rex	260	231	204	234	160	219	278	227	16
Sabine	230	181	151	160	144	187	209	180	16
Thad	244	199	183	253	165	200	270	216	17
RU1604193	275	226	218	179	162	236	294	227	19
RU1704077	261	197	207	206	185	242	300	228	17
RU1704114	215	211	173	175	165	197	218	193	11
RU1704157	265	217	182	178	176	201	284	215	19
17HAST008	258	182	201	252	173	216	299	226	19
17HAST009	260	214	191	222	180	206	290	223	16
17CVST010	270	213	180	245	172	209	287	225	18
17CVST004	258	202	180	248	169	233	298	227	19
Mean	250	202	202	195	179	233	281	221	
LSD	43	24	27	41	22	30	34		
CV	10.5%	14.8%	16.6%	25.5%	7.4%	18.4%	7.4%		
Planting Date	April 21	April 13	March 27	March 26	May 14	April 12	April 12		
Emergence date	August 29	September 20	August 28	September 4	October 4	August 28	August 30		

[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 on-farm locations, 2018.

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													
CL XL745	RT	237	49.6	70.1	10.6	11.7	36.0	44	76	50	2	28.1	16132
RT7311 CL	RT	277	46.9	69.3	14.0	11.8	35.8	43	78	24	2	26.4	17225
XP753	RT	297	45.6	70.5	12.8	11.7	36.9	44	78	13	1	26.8	16949
Gemini 214 CL	RT	290	51.1	68.8	8.1	11.8	35.7	45	80	11	1	26.1	17366
RT7801	RT	267	48.6	69.0	7.1	14.0	35.7	43	87	23	2	29.5	15390
Clearfield													
CL111	LA	205	51.5	69.6	10.8	11.9	37.8	40	77	17	2	27.9	16297
CL151	LA-HA	191	50.6	69.4	13.6	12.9	37.3	40	80	33	2	26.9	16904
CL153	LA-HA	220	54.8	69.3	6.8	12.3	37.4	38	81	5	1	26.4	17178
CL163	MS-HA	203	53.8	67.9	10.9	12.1	36.4	41	85	18	2	27.7	16381
CL172	AR-HA	204	55.2	68.8	5.6	13.0	38.2	39	83	0	1	26.6	17086
PVL01	LA	188	51.8	68.9	10.2	12.5	34.0	39	86	0	1	29.4	15465
RU1504083	MS	218	47.6	68.1	14.7	11.9	36.2	37	80	6	1	27.9	16256
RU1504197	MS	226	52.8	68.2	9.6	12.2	39.3	38	83	2	1	24.8	18317
RU1604197	MS	230	48.6	68.1	12.3	14.4	38.3	42	84	0	1	25.9	17558
RU1704055	MS	221	49.7	67.5	10.4	12.8	35.0	41	84	6	1	30.4	14955
RU1704122	MS	224	46.2	68.7	9.3	11.8	35.7	39	80	0	1	28.2	16091
RU1704154	MS	203	49.1	68.4	13.1	12.3	35.2	39	81	1	1	28.7	15811
RU1704196	MS	174	49.3	67.9	10.7	12.5	36.8	40	80	43	2	27.9	16297
RU1704198	MS	221	48.1	67.9	11.9	11.9	36.9	37	83	12	2	26.6	17040
17CLST022	MS	230	48.7	68.2	13.1	12.6	36.9	38	83	1	1	28.5	15930
Conventional													
Bowman	MS	194	54.1	68.5	4.8	13.5	38.9	38	86	0	1	27.9	16297
Cheniere	LA	181	57.0	71.6	6.9	12.0	36.6	37	82	14	1	25.9	17510
Diamond	AR	220	49.8	68.1	8.2	13.5	38.6	41	83	7	1	27.4	16552
LaKast	AR	227	48.9	68.8	6.3	12.1	38.7	42	82	13	1	29.1	15617
Mermentau	LA	205	58.6	69.2	12.2	12.8	37.3	39	81	0	1	27.0	16815
Rex	MS	227	54.9	67.2	9.5	12.4	38.4	40	82	0	1	29.6	15353
Sabine	TX	180	55.3	69.8	8.0	12.3	38.3	40	82	0	1	27.5	16509
Thad	MS	216	53.3	68.0	5.2	13.7	39.8	40	87	0	1	26.9	16904
RU1604193	MS	227	55.6	70.1	5.3	12.9	38.7	43	85	10	1	26.4	17178
RU1704077	MS	228	47.4	66.7	8.5	13.1	39.2	42	81	8	1	27.7	16381
RU1704114	MS	193	43.1	69.2	8.7	11.8	34.8	38	80	7	1	26.8	16949
RU1704157	MS	215	49.4	69.7	7.1	12.1	37.3	41	82	14	2	25.2	18006
17HAST008	MS	226	51.1	68.0	13.9	12.1	37.4	37	80	0	1	28.8	15772
17HAST009	MS	223	52.4	67.3	9.7	12.6	38.0	39	83	0	1	27.6	16424
17CVST010	MS	225	53.8	68.3	9.0	12.4	38.7	39	85	0	1	27.1	16770
17CVST004	MS	227	48.8	69.3	6.8	12.2	38.4	37	82	0	1	28.1	16173
Mean		221	51	69	10	12	37	40	82	9	1	27	16551
LSD		27.2	6.9	1.3	2.7	1.0	7.9	2.0	3.8	17.8	0.6	1.8	
CV		20.4	18.1	2.5	38.3	13.8	28.4	6.8	6.2			9.0	

[1]AR = Arkansas; LA = Louisiana; MS = Mississippi; 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, hybrids, and experimental lines grown at on-farm locations from 2016–18.[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						
Bowman	MS	200	58.0	69.8	4.3	42.1	39	91	2	1	26.1	17446
Cheniere	LA	188	60.8	72.5	6.0	40.0	37	89	7	1	22.9	20045
Diamond	AR	228	52.1	69.3	7.9	41.1	42	88	2	1	24.6	18607
Lakast	AR	223	50.5	69.7	6.7	41.3	43	88	8	1	26.3	17392
Mermentau	LA	200	60.9	70.2	11.1	40.2	40	88	0	1	23.8	19282
Rex	MS	222	57.5	68.3	8.7	41.3	42	88	1	1	27.4	16663
Sabine	TX	184	59.6	70.5	5.7	41.6	40	89	0	1	24.6	18549
Thad	MS	223	55.9	69.2	5.6	43.1	40	90	2	1	25.6	17790
XP753	RT	289	50.2	71.2	11.3	39.2	43	85	5	1	25.3	18020
						Clearfield						
CL151	LA-HA	197	56	70	11.9	40.3	39	86	24	1.9	24.0	19039
CL163	MS-HA	198	57	69	10.0	38.8	41	90	26	1.9	25.1	18209
CL 172	AR-HA	202	59	70	4.7	41.1	39	89	1	1.0	24.4	18721

[1]Data presented are the averages of 21 total sites that served as the On-Farm Variety Trials for 2015–17. Listed entries were included in all 3 years.
[2]AR = Arkansas; LA = Louisiana; MS = Mississippi; 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
CL111	120	45	90-120	45
CL1513	90-135	0-45	90	45
CL152	120-150	45	120	45
CL1534	120-150	30-60	90-120	30-60
CL1634	120-150	45	120	45
CL1724	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
Lakast4	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
Rex	120-150	45	120	45
Sabine	120-150	30-60	90-120	30-60
Thad5	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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