

Results and Discussion

Yield data is reported from seven locations for wheat and two locations for oats in 2008. The planting season was generally good and adequate stands were established at all sites. There was a very wet period from mid December through late February that limited tillering and resulted in root rot and thin stands in some trials. The spring was dry, with good growing conditions and moderate disease pressure. Leaf rust incidence was higher than normal but there was little stem rust or stripe rust. Heavy rains late May at some locations and resulted in harvest problems and reduced test weight for those trials not already harvested.

Performance of Wheat Varieties Across South Louisiana

South Region Means

Performance of wheat varieties tested across south Louisiana in 2008 is shown in Table 1. Bold print indicates that the entry is a released variety and normal print indicates that the entry is a breeding line that is not commercially available. AGS 2060 (74.5 bu/acre), AGS 2020 (65.5 bu/acre), AgriPro Coker Magnolia (63.0 bu/acre) and Delta King DK9108 (63.4 bu/acre) were the highest yielding released varieties. Four breeding lines LA95005UC-31-3 (73.1 bu/acre), GA981622-5E35 (70.3 bu/acre), GA981621-5E34 (69.8 bu/acre), and LA01138D-21 (69.6 bu/acre) rounded out the top five entries for South Louisiana. The means of 55 entries included 51.7 bu/acre for yield and 55.0 lbs/bu for test weight.

Leaf rust pressure was moderate with several entries having ratings near 50%. The test mean for leaf rust was 12%. Septoria leaf and glume blotch, and a mixture of foliar diseases (Leaf blotch) occurred at several locations and there were significant differences among varieties.

In performance across south Louisiana for two years, the released variety AGS 2060 (79.6 bu/acre) and the breeding line LA99005UC31-3 (79.2 bu/acre) led in mean yields (Table 2). Terral LA482 (74.3 bu/acre), LA98214D-14-1-2 (74.0 bu/acre) and AGS 2020 (73.9 bu/acre) rounded out the top five in yield. The 27 entries tested at Baton Rouge, Crowley, and Jeanerette for two years had means of 66.8 bu/acre for yield and 55.7 lbs/bu for test weight. Ten of the 12 lowest- yielding entries had heading dates later than the average of 93 days (day of year), while none of the 10 highest-yielding entries headed later than 91 days. Late-heading varieties generally perform poorly in south Louisiana. Significant differences among varieties existed for leaf rust and stem rust incidence.

Fourteen entries were tested over three years in south Louisiana with AGS 2060 (79.6 bu/acre), Terral LA482 (76.0 bu/acre), and AgriPro Coker Magnolia (73.9 bu/acre) having the top three yields (Table 3). The top five was rounded out by Terral LA841 (73.6 bu/acre) and Delta King DK9108 (71.4 bu/acre). Test means were 68.0 bu/acre for yield and 56.4 lbs/bu for test weight. The top five entries all received low (good) ratings for leaf rust and stem rust.

Baton Rouge

At Baton Rouge, two breeding lines, LA99005UC-31-3 (82.0 bu/acre) and GA981622-5E35 (79.6 bu/acre) had the highest yields (Table 4). A second breeding line, LA978UC-36-1-1 (71.4 bu/acre), and two released varieties, AGS 2020 (69.6 bu/acre) and Terral LA841 (66.1 bu/a) also ranked in the top five for yield. The average yield at Baton Rouge, 52.5 bu/acre, is relatively low and can be attributed to heavy rainfall during the winter and subsequent root rot and loss of tillers. The test was harvested a little late (for adapted entries) because of the delayed heading and maturity of some entries. This resulted in decreased test weights on those entries that had a normal heading date, due to heavy rainfall after maturity. The average heading day was 98 (March 28). Late heading/maturing varieties and delayed harvest date also decreased yields of some earlier entries due to bird damage. Leaf rust pressure was high, with ratings from 0 to 70%. Septoria ratings ranged from 1.0 to 3.0 (0-9).

Crowley

The test at Crowley was good, with an average yield of 60.1 bu/acre. At this location, two breeding lines LA98214D-14-1-2 (83.6 bu/acre) and GA981621-5E34 (82.6 bu/acre) led 55 entries in yield in 2008 (Table 5). Three more breeding lines, LA01138D-21, LA99005UC-31-3, and GA981622-5E35 ranked in the top five, all with yields above 80.0 bu/acre. The average test weight at Crowley, 54.1 lbs/bu, is low partly due to heavy rainfall prior to harvest. Leaf rust pressure was high with ratings ranging between 0 and 75%, and a mean of 17%. Average heading was 84 days at this location.

Jeanerette

The test at Jeanerette suffered from poor tillering and resulting yields were somewhat low. A released variety, AGS 2060 (63.9 bu/acre) led 55 entries for yield at Jeanerette in 2008 (Table 6). The breeding line LA98149BUB-3-4 (61.9 bu/acre) ranked second with a yield of 61.9 bu/acre. Two additional released varieties, Delta King DK9108 and Magnolia, and a second breeding line, LA0113D-44 round out the top five entries, all with yields above 59.0 bu/acre. Test means include 42.4 bu/acre for yield and 54.7 lbs/bu for test weight. Average heading occurred at day 95 at this location. Leaf rust pressure was moderate at this location with ratings ranging from 0 to 35%.

Performance of Wheat Varieties Across North Louisiana

North Region Means:

Yields were good across North Louisiana in 2008 (Table 7). USG 3555 (78.3 bu/acre) had the highest yield of 60 entries with the breeding line VA01W-205 and the released varieties AGS 2060, Dixie 427, and USG 3295 rounding out the top five, all with yields above 76.0 bu/acre. AGS 2060 and USG 3295 also had excellent test weights. The

average yield and test weight of 60 entries was 65.6 bu/acre and 57.7 lbs/bu. Magnolia was missing from the 2008 Winnsboro test, which was the highest-yielding site, and added 5.7 bu/acre to the mean of each entry, on average. Leaf rust pressure was high with ratings ranging between 0 and 80%, while stripe rust pressure was minimal.

In two years across North Louisiana (Table 8), two released varieties, AGS 2060 (77.3 bu/acre) and USG 3555 (77.2 bu/acre) had the highest yields of 32 entries. The breeding line LA978UC-36-1-1 and the released varieties USG 3295 and Ragan & Massey LA95135 ranked in the top five, all with yields above 75.0 bu/acre. Averages included 70.7 bu/acre for yield and 58.02 lbs/bu for test weight. Leaf rust ratings were moderate, ranging from 0-29% with an average of 9%. Stripe rust did not occur at significant levels in the past two years. Average heading day was 90 (day of year).

AGS 2060 (78.7 bu/acre) had the highest yield and second-highest test weight across north Louisiana for three years (Table 9). Four other released varieties, Magnolia, USG 3295, Pioneer 26R87, and LA95135 rounded out the top five, all with yields above 76.0 bu/acre and good to excellent test weights.. Averages for three years include 72.2 bu/acre for yield and 57.6 lbs/bu for test weight. Among the top five, leaf rust levels were low to moderate (0-12%) and stem rust levels were low (0-1).

Alexandria

Yields at Alexandria were moderate, with an average of 49.7 bu/acre (Table 10). AGS 2060 (69.3 bu/acre) had the highest yield at this location in 2008. Three other released varieties, DK9108, Pioneer 26R87, and LA95135 ranked in the top five, all with yields above 63 bu/acre. The breeding line LA978UC-36-1-1 ranked fifth with a yield of 62.3 bu/acre. The averages test weight was 58.3 lbs/bu. Leaf rust levels were low with all top five entries having no symptoms and a test mean of only 3%.

Bossier City

At this location, a breeding line, VA01W-205 (82.2 bu/acre) had the highest yield (Table 11). Four released varieties, Dixie 427, USG 3555, DK9108, and AGS 2060 also ranked in the top five, all with yields above 74.5 bu/acre. Test averages include 62.1 bu/acre for yield, 58.0 lbs/bu for test weight and 95 for heading day. No disease notes were taken at this location.

St. Joseph

This location had excellent yields with USG 3295 (89.1 bu/acre) ranking first (Table 12). Two breeding lines, GA981621-5E34 (87.8 bu/acre) and VA01W-205 (83.0 bu/acre) and two additional released varieties, USG 3555 (87.8 bu/acre) and AGS 2031 (83.9 bu/acre) also ranked in the top five. Test averages include 67.9 bu/acre for yield, and 56.5 lbs/bu for test weight. One very early-heading experimental line, Terral TVX85771, was seriously damaged by birds, so reliable yield data was not obtained from

this entry. The average heading day was 92. Very high levels of leaf rust occurred at this location, with an average of 31% and a high of 98%.

Winnsboro

The test at Winnsboro was excellent in 2008 and produced very high yields. The breeding line LA99005UC-31-3 ranked first of 59 entries planted at this location, with a yield of 106.5 bu/acre (Table 13). GA981621-5E34, LA99164UC-53-1, LA978UC-36-1-1, and AGS 2020 also yielded above 96.6 bu/acre. Magnolia was not planted at this highest yielding location due to a seed packaging error. Test averages include 82.8 bu/acre for yield and 58.1 lbs/bu for test weight. Leaf rust pressure was moderate and stripe rust pressure was low with test averages of 7% and 0%.

Over two years, LA99005UC-31-3 again ranked first at Winnsboro with a yield of 100.3 bu/acre. Two other LA breeding lines, as well as two varieties, AGS 2020 and 2026, also ranked in the top five, with yields above 91.0 bu/acre.

Statewide Performance of Wheat Varieties

Table 14 contains the average performance of 55 entries across seven locations in 2008. Yield data are separated into locations and ranked according to statewide mean yield in Table 14B. The only released variety in the top five, AGS 2060, had the highest statewide mean yield of 76.6 bu/acre. Four breeding lines, two from Georgia and two from Louisiana, also ranked in the top five, all with yields above 70.0 bu/acre compared to the test average of 60.0 bu/acre.

AGS 2060 and Pioneer 26R87 had the highest test weights of 59.2 lbs/bu compared to the statewide test average of 56.6 lbs/bu. Leaf rust levels were moderate with an average of 15%. Four of the top five entries had leaf rust ratings of 0%.

Twenty seven entries were tested across Louisiana in 2007 and 2008 (Table 15). AGS 2060 had the highest yield of 78.4 bu/acre compared to the average of 69.5 bu/acre. Four LA breeding lines took the other top five rankings, all with yields above 73.0 bu/acre. AgriPro Coker Magnolia, AGS 2026, Terral LA841, and Ragan & Massey LA95135 rounded out the top five released varieties with yields of at least 72 bu/acre. The top five entries scored below the leaf rust average of 7%.

Over the three years 2006, 2007, and 2008, 14 entries were tested across Louisiana. Four locations reported in 2006, six in 2007, and seven in 2008. The released variety AGS 2060 had the highest yield of 79.2 bu/acre compared to the average of 70.7 bu/acre. The four other varieties ranking in the top five all had yields above 73.3 bu/acre.

OTHER WHEAT TRIALS

The 2008 USDA Uniform Southern Soft Red Winter Wheat Nursery contained 42 entries and was planted at Baton Rouge and Winnsboro (Tables 17 and 18). The leading entry at Baton Rouge was a Georgia breeding line, GA991336-6E9 with a yield of 81.4 bu/acre compared to the mean of 49.2 bu/acre. At Winnsboro, two other Georgia breeding lines, GA991371-6E13 and GA991209-6E33 tied for the top yield of 89.9 bu/acre compared to the test average of 52.3.

Wheat Preliminary Yield Trial A (WPA) was planted at Baton Rouge and Winnsboro in 2008 (Tables 19 and 20) and contained 32 entries (28 experimental lines and 4 checks). At Baton Rouge, AGS 2020 had the top yield of 77.2 bu/acre compared to the average of 61.9 bu/acre. This location was harvested late due to many late-maturing entries and consequently suffered yield and test weight reductions due to bird damage and heavy rains prior to harvest. The Arkansas breeding line AR01080-91-3-C had the top yield of 104.4 bu/acre at Winnsboro compared to the average of 84.3 bu/acre. Across Baton Rouge and Winnsboro (Table 22), the leading entry had a yield of 90.2 bu/acre compared to the mean of 77.1 bu/acre.

Wheat Preliminary Yield Trial B (WPB) was planted at Baton Rouge and Winnsboro and contained 24 entries (Tables 23 and 24). At Baton Rouge, the check AGS 2060 had the highest yield of 66.4 bu/acre compared to the average of 49.4 bu/acre. Delayed harvest due to rainfall at this location led to lowered yields and test weights. The breeding line LA01158D-36-6-C had the top yield of 90.9 bu/acre compared to the average of 75.9 bu/acre at Winnsboro.

Wheat Preliminary Yield Trial C (WPC) was planted at Baton Rouge in 2008 and contained 18 entries (Table 25). The leading entry, the breeding line LA01172D-27-5-4 had a yield of 70.5 bu/acre compared to the test average of 59.9 bu/acre. Late harvest led to lower test weights in this trial.

Performance of Oat Varieties

The oat variety performance trial contained 26 entries and was conducted at Baton Rouge and Winnsboro in 2008. The top 5 yielding entries contained only one released variety, Horizon 270, which ranked first with a yield of 136.5 bu/acre. Four breeding lines, one from Texas, one from Louisiana and two from Florida, rounded out the top five, all with yields above 129.6 bu/acre. The varieties LA99016 and Horizon LA976 also yield at least 125 bu/acre. The test means included 118.5 bu/acre for yield and 34.4 lbs/bu for test weight.

Table 27 contains oat variety trial data for two years. The top five entries include three released varieties and two breeding lines, one of which, TX02U768, had the highest yield of 132.5 bu/acre. The top five entries all had yields greater than 125 bu/acre, well above the test mean of 116.5 bu/acre. Other test means include 34.5 lbs/bu for test weight, 6% for crown rust and 1.8(0-9) for stem rust.

In the oat variety trial across Louisiana for three years (Table 28), the breeding line TX02U7682 (134.3 bu/acre) again ranked first with a yield well above the test mean of 113.9 bu/acre and a test weight of 34.1 lbs/bu. The three year test weight mean was 33.6 lbs/bu. Horizon 270 and LA99106 were the highest-yielding released varieties.

Baton Rouge:

The variety Horizon 270 ranked first at this location with a yield of 126.4 bu/acre (Table 29). The top five also included four breeding lines, one from Texas, two from Louisiana, and one from Florida all with yields above 115 bu/acre, coupled with 0% crown rust and good stem rust ratings. Test means included 100.7 bu/acre for yield and 33.1 lbs/bu for test weight. The average crown rust incidence was only 3%, but the susceptible variety 'Brooks' had 70% crown rust, which indicates that the other entries had good resistance. Stem rust pressure was moderate with a range of 0.3 to 4.7, where a '0' indicates none and a '9' indicates severe stem rust.

Winnsboro:

At this location, the breeding line FL99212-D6 ranked first with a yield of 152.7 bu/acre (Table 30). Three other breeding lines and one variety (LA99016) rounded out the top five, all with yields of at least 149.0 bu/acre. Test means included 136.4 for yield and 35.7 lbs/bu for test weight. Dry conditions resulted in very low disease pressure and high test weights at this location.

Preliminary Oat Yield Trial 'A':

At Baton Rouge (Table 33), the breeding line WIX8347-2 and the variety Horizon 270 led this test, both with a yield of 132.3 bu/acre. Three breeding lines, one from Louisiana and two from Florida rounded out the top five entries, all with yields at or above 118.0 bu/acre. Test means included 99.5 bu/acre for yield, 33.8 lbs/bu for test weight, 6% for crown rust and 1.4(0-9) for stem rust.

At Winnsboro (Table 34), the variety LA99016 led the test with a yield of 126.7 bu/acre. Three LA breeding lines and a second released variety, Horizon 270, also ranked in the top five, all with yields above 138 bu/acre. Test means at this location included 126.7 bu/acre for yield and 32.9 lbs/bu for test weight.

Across the Baton Rouge and Winnsboro locations (Table 35), two released varieties, Horizon 270 (135.2 bu/acre) and LA99016 (134.2 bu/acre) ranked first and second in yield. Three breeding lines, two from LA, also ranked in the top five with yields above 126 bu/acre. Test means across both locations include 113.1 bu/acre for yield and 33.4 lbs/bu for test weight.

Preliminary Oat Yield Trial 'B':

Oat Prelim-B data from Baton Rouge can be found in Table 36. The released variety Horizon 270 (145.7 bu/acre) had the highest yield in this test. Three LA breeding lines and one Florida breeding line also ranked in the top five, all with yields above 122

bu/acre. Test means include 88.1 for yield, 31.6 lbs/bu for test weight, 8% for crown rust and 1.8 (0-9) for stem rust.

Uniform Oat Nursery at Baton Rouge:

The USDA regional Uniform Winter Oat Yield Nursery was grown at Baton Rouge (and other locations across the southern US). The test contained 25 entries, five of which are released varieties. A Texas breeding line TX02U7682 ranked first with a yield of 142.9 bu/acre. Four other breeding lines, from Louisiana, Texas and Florida ranked in the top five, all with yields above 123.5 bu/acre. Test means include 93.7 bu/acre for yield and 31.2 lbs/bu for test weight, 8% for crown rust and 2.9 (0-9) for stem rust.

Other Oat Trials:

The LSU AgCenter and University of Florida oat breeding programs have a cooperative project to develop nuda (hull-lees, naked) oat varieties for the southern US. Naked oats have a loosely attached hull that comes off during combining. The resulting grain is much higher in protein and oil, and lower in crude fiber than conventional oats.

Elite Nuda Oat Trial consisted of 35 entries (31 experimental lines and 4 checks) and was planted at Baton Rouge in 2008. The two hulled checks, Trophy (101.7 bu/acre) and Horizon 321 (83.4 bu/acre) ranked first and second respectively for grain yield. If we assume that the average percent hull is 25% then a 100 bushel conventional yield would equal the 75 bushels after mechanical dehulling. Seven breeding lines yielded greater than 70 bu/acre with a high percentage of hull-less seed (Nuda Pct), excellent test weights, and good disease reaction. FL03011-K4 had a yield of 79.7 bu/acre, which is roughly equal to a yield of 106 bu/acre for a hulled oat. It also had a test weight of 43.0 lbs/bu, 23% higher than the best conventional variety.

Advanced Nuda Oat Trial contained 25 entries (21 experimental lines and 4 checks) and was planted at Baton Rouge. The conventional check Horizon 270 ranked first with a yield of 115.4 bu/acre and test weight of 31.6 lbs/bu. The naked oat line, FL04178-FLID-B-S-2 had a yield of 98.5 bu/acre with a test weight of 39.1 lbs/bu and 98% naked seed. This line and others yielded substantially more than the released naked oat varieties Buff (North Dakota) and Caballo (North Carolina).