

RESULTS AND DISCUSSION

PERFORMANCE OF WHEAT VARIETIES ACROSS SOUTH LOUISIANA:

South Region Means:

Torrential rains prior to harvest resulted in lodging and sprouting in the head at Baton Rouge and Crowley. Jeanerette was harvested but test weight data were not collected due to grain shriveling that resulted from heavy rainfall.

Performance of wheat varieties tested for two and three years across south Louisiana is shown in Table 2. There are six environments (year-locations) in the three-year means and five in the two-year means as listed at the bottom of the table.

AgriPro/Panola had the highest two-year mean yield (83.8 bu/acre). The average yield of 31 entries tested for two years was 71.3 bu/acre and the average test weight was 56.9 lbs/bu. The average heading date was 98 (day of year). Nine of the 10 entries with mean heading date greater than 100 had a mean yield less than 67 bu/acre (>4 bu/acre below test mean) which show the importance of avoiding late-heading varieties in south Louisiana.

Leaf rust pressure has been light in south Louisiana for the past two years, partly due to weather patterns. Leaf rust incidence ranged from 0 to 7% with an mean of only 2%. Stripe rust incidence ranged from 0 to 20% with a mean of 4% and was minimal in 2004.

Terral LA841 has the highest three-year mean yield (77.4 bu/acre) of 12 entries (Table 2). The average yield was 71.8 bu/acre and the average test weight was 56.3 lbs/bu.

Jeanerette:

Jeanerette was the only south Louisiana location harvested in 2004. There was significant bird damage at Jeanerette in 2004 with preferential feeding on earlier-heading entries. LA95283CA78-1-2-B, the earliest-heading line in the test, had a bird damage rating of 84% and subsequently the lowest grain yield. The average yield at Jeanerette was 72.7 bu/acre (Table 3). Test weight was not recorded because the grains were weathered and shriveled from heavy rainfall after maturity. McCormick, Genesis RO 24, DK 1551W, Terral LA841, and HBK 3266 had two-year mean yield greater than 72.0 bu/acre. Terral/LA841 had the highest three-year mean yield.

PERFORMANCE OF WHEAT VARIETIES ACROSS NORTH LOUISIANA:

Northern Regional Means:

Wheat performance trials were harvested at Bossier City and Winnsboro in 2004. Trials at Alexandria and St. Joseph were lost to RoundUp herbicide drift. LA9560CA22-1 had the highest grain yield (94.0 bu/acre) and the highest test weight (60.5 lbs/bu) across north Louisiana in 2004 (Table 4). The average yield of 70 entries was 74.8 bu/acre and the average test weight was 56.7 lbs/bu. Average heading dates ranged from

83 to 101 (day of year) with a mean of 93 (April 2). Leaf rust pressure was moderate across the two north Louisiana locations with a mean of 8% and a high of 34% coverage of the upper two leaves. Stripe rust pressure was heavy with a mean of 14% and a high of 86%. Ten of the 15 lowest-yielding entries had >25% stripe rust whereas all of the 24 the highest-yielding entries has <21% stripe rust. This clearly shows the importance of stripe rust resistance and impact of the disease on grain yield.

Forty entries have been tested for two years across north Louisiana for two years (5 year-locations) as shown in Table 5. Terral LA841 has the highest two-year mean yield (87.0 bu/acre). AgriPro Natchez, AgriPro Panola, Terral TV8466, LA95181BUB40-1, USG 3209, and Dixie 9812 also have two-year mean yields greater than 85 bu/acre. The average test weight was 55.4 lbs/bu. LA96140BUA70-2 had the highest mean test weight (57.6 lbs/bu). The average leaf rust incidence was 6% and the average stripe rust incidence was 13%. Of the 18 highest-yielding entries, 17 had less than 17% stripe rust whereas 10 of the 18 lowest-yielding entries had greater than 15% stripe rust. This demonstrates the importance of stripe rust resistance in Louisiana.

Terral LA841, USG 3209, and AgriPro Natchez had average yields higher than 75 bu/acre across three years (9 year-locations) in north Louisiana (Table 6). The average yield of 21 entries was 58.2 bu/acre and the average test weight was 55.1 lbs/bu. The 10 highest-yielding entries had combined rust (stripe rust plus leaf rust) incidence of less than 20% whereas only 2 of the 11 lowest-yielding entries had a mean combined rust incidence less than 20%.

Bossier City:

Yields were very high at Bossier City in 2004, with an average for 70 entries of 80.9 bu/acre (Table 7). LA9560CA22-1, Dixie 9812, and LA96140BUA70-2 had yields greater than 100 bu/acre. The average test weight was 57.9 lbs/bu. Seven entries had test weights higher than 59 lbs/bu with a high of 61.2 lbs/bu (LA9560).

Leaf rust pressure was moderate with a high of 33% while stripe rust pressure was severe with a high of 85%. Of the 20 highest-yielding entries, 16 had less than 10% stripe or leaf rust whereas 17 of the 20 lowest-yielding entries had a stripe or leaf rust rating greater than 10%.

Winnsboro:

The average yield of 70 entries at Winnsboro was 68.7 bu/acre (Table 8). LA95283CA78-1-2-B, AR910-9-1, LA95181BUB40-1, UGA931233-E17, and Terral LA841 yielded over 90 bu/acre. The average test weight was 55.7 lbs/bu. LA96140BUA70-2, LA9560CA22-1, and LA97113UC-124-3-B were the only entries with test weights greater than 58 lbs/bu.

Leaf rust pressure was moderate and stripe rust pressure was very heavy. The average leaf rust incidence was 10% and 13 entries had at least 25% leaf rust. Only 1 of

these 13 yielded higher than the test mean. The average stripe rust incidence was 19% and 13 entries had at least 50% stripe rust, including 11 of the 13 lowest-yielding entries.

STATEWIDE PERFORMANCE OF WHEAT VARIETIES:

The average yield of 60 entries tested across Louisiana in 2004 was 74.9 bu/acre (Table 9). LA9560CA22-1 had the highest yield (91.9 bu/acre) and the highest test weight (60.5 lbs/bu). Terral LA841, AgriPro Panola, USG 3209, and DK 1551W were the highest-yielding released varieties. The average test weight was 56.7 lbs/bu. Significant differences occurred among varieties for lodging, leaf rust, stripe rust, and phenotype. Phenotype is an overall rating of visual appeal of the variety prior to maturity and takes into account tillering, vigor, general plant health, and yield potential.

AgriPro Panola had the highest two-year mean yield (84.6 bu/acre) across Louisiana (Table 10). DK 1551W, Terral LA841, Terral TV8466, and RO24 also yielded at least 80 bu/acre. The average test weight was 55.8 lbs/bu. LA96140BUA70-2 and Vigoro Tribute had the highest test weights.

Terral LA841 had the highest three-year mean yield (75.0 bu/acre) across Louisiana (Table 11). The average yield of 12 entries was 69.3 bu/acre. Significant differences occurred among entries for leaf and stripe rust.

Performance of LAES Advanced Breeding Lines in Preliminary Yield Trial 'A':

Tables 12, 13, 14, and 15 show data for entries in Prelim-A. This is the most advanced "prelim" nursery contains LSU AgCenter breeding lines at the stage prior to statewide and regional testing. The average yield of 35 breeding lines and check varieties across 3 locations was 72.0 bu/acre and the average test weight was 56.2 lbs/bu. LA95181BUB40-2-2-C was the highest-yielding entry, followed by USG3209. LA95181BUB40-1 and LA96140BUA70-2 performed well in this test and were also tested in the statewide variety trials. LA96140BUA70-2 had the highest test weight of all entries. Stripe rust pressure was heavy and susceptible lines generally had poor yields.

PERFORMANCE OF OAT VARIETIES

Oat variety trials were conducted at Baton Rouge, Bossier City, and Winnsboro during the 2003-04 season. The trial included 9 commercial varieties and 19 breeding lines.

PERFORMANCE OF OAT VARIETIES ACROSS LOUISIANA:

The average yield of 28 entries across Louisiana for 2004 was 93.4 bu/acre (Table 16) and the average test weight was 31.7 lbs/bu. LA96006BSB-270-S2-C had the highest yield and also had no crown or stem rust. Horizon 314 and Plot Spike LA9339 were the highest-yielding released varieties. Plot Spike had a test weight of 33.2 lbs/bu. Crown rust incidence was low with a mean of 3% and a high of 40% (Brooks). Stem rust pressure was also light.

LA98009SBS-49-B-S1, LA96006B119-1, and Plot Spike LA9339 were the three-highest-yielding entries for two years across Louisiana (Table 17). The average yield of 13 entries was 108.9 bu/acre and the average test weight was 32.0 lbs/bu.

LA96006B119-1, Horizon 321, and Plot Spike LA9339 had three-year mean yields greater than 116 bu/acre (Table 17) and higher than average test weights. All three oat entries also showed good crown and stem rust resistance.

Baton Rouge:

LA96006BSB-270-S2-C has a yield of 111.8 bu/acre at Baton Rouge (Table 18). Eight other entries also yielded above 100 bu/acre including LA97006GBS-22-B-S2 which had the highest test weight (33.1 lbs/bu). The average test weight was 30.3 lbs/bu. Crown rust pressure was unusually light for Baton Rouge with a mean of 4% and a high of 53%. Stem rust pressure was also very low.

Bossier City:

Harrison was the highest-yielding entry at Bossier City (Table 19) and also had an excellent test weight. The average yield was 69.2 bu/acre. The oat test at Bossier City struggled all year and never really looked good, which is reflected in the yields. Crown and stem rust did not occur at this location.

Winnsboro:

Oat yields at Winnsboro were excellent, with an average of 118.7 bu/acre (Table 20). LA96006BSB-270-S2-C has the highest yield (152.0 bu/acre) at Winnsboro and also at Baton Rouge. Test weights at Winnsboro were excellent, with an average of 33.7 lbs/bu. Four entries had test weights higher than 36 lbs/bu. All varieties lodged quite a bit although there were differences in the degree among varieties. Lodging occurred after maturity as a result of rains and subsequently delayed harvest. Crown and stem rust pressure were low.

Preliminary Oat Yield Trial 'A' and 'B':

Tables 21, 22, and 23 show the performance of 27 advanced oat breeding lines in Prelim-A at Baton Rouge and Winnsboro. Plot Spike LA9339 (check) had the highest mean yield (126.0 bu/acre). Three LA breeding lines also yielded more than 120 bu/acre. The average test weight was very good (32.7 lbs/bu).

The average yield was good at Baton Rouge (98.6 bu/acre) and the average test weight was 31.0 lbs/bu (Table 22). LA9916SBSB-98-S had the highest yield along with an excellent test weight, good lodging resistance, and resistance to crown and stem rust.

The average yield at Winnsboro was 121.3 bu/acre (Table 23) and the average test weight was 34.3 lbs/bu. Crown rust pressure was light. Stem rust developed to a high level on the susceptible variety, Harrison, and resulted in a low yield.

Oat Prelim-B precede Prelim-A in variety development and is only grown at Baton Rouge. The average yield of 54 entries was 104.4 bu/acre with a range of 64.0 to 129.5 bu/acre (Table 24). The average test weight was 29.4 lbs/bu with a range of 24.2 to 33.5 lbs/bu.

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 average yield of 29 entries was 87.3 bu/acre (Table 25). LA9825SBSB-59-C had the highest yield (111.3 bu/acre), followed by Harrison and two LA976 sib lines. The average test weight was 28.6 lbs/bu. A number of entries were susceptible to crown rust which resulted in premature death and low test weight and yield.