

## RESULTS AND DISCUSSION

### PERFORMANCE OF WHEAT VARIETIES ACROSS SOUTH LOUISIANA:

#### South Region Means:

Performance of wheat varieties tested across south Louisiana in 2005 is shown in Table 1. Bold print in all tables indicates that the entry is a released variety and normal print indicates that the entry is a breeding line that is not commercially available. LA9560CA22-1 (89.9 bu/acre) and LA95181BUB40-1 (86.3 bu/acre) were the two highest-yielding entries. DK GR9108 (86.0 bu/acre) and Terral LA841 (81.7 bu/acre) were the highest-yielding released varieties, followed by Pioneer/26R61 and Coker 9152. The average yield of 64 entries was 65.2 bu/acre and the average test weight was 57.6 lbs/bu. Test weights ranged from 47.1 to 61.4 lbs/bu and disease pressure was moderate. The average stripe rust rating was 6% and the average leaf rust rating was 9%. There was little septoria leaf or glume blotch due to limited rainfall during grainfill.

DK GR9108 and Terral LA841 have the highest two-year mean yields (85.1 & 82.4 bu/acre) of released varieties across south Louisiana (Table 2). Three LA breeding lines also yielded over 80 bu/acre. The average yield of 36 entries tested for two years (3 environments) across south Louisiana is 66.7 bu/acre and the average test weight is 57.9 lbs/bu.

AgriPro/Panola has the highest three-year mean yield (79.8 bu/acre) across south Louisiana (Table 3) of 21 entries. Terral LA841 and DK 1551W also have mean yields greater than 75 bu/acre. The average test weight is 57.5 lbs/bu. The five highest-yielding entries have stripe rust incidence of less than 5%.

#### Baton Rouge:

Pioneer/26R61, Terral LA841, and DK GR9108 were the highest-yielding varieties at Baton Rouge for 2005 (Table 4). The highest-yielding entries were LA95181BUB40-1 and LA9560CA22-1 breeding lines. The average yield of 64 entries is 66.7 bu/acre and the average test weight is 59.0 lbs/bu. April was very dry in Baton Rouge which resulted in low disease pressure and excellent test weights. Nine entries had test weights greater than 61 lbs/bu, led by USG3350 (63.0 lbs/bu) and Pioneer/26R61 (62.1 lbs/bu). Disease pressure was moderate, with an average stripe rust rating of 6% and a high of 45%. The average leaf rust rating was 8% with a high of 50%. The 11 highest-yielding entries had stripe and leaf rust ratings of less than 2% and headed out between days 84 and 97. This is in contrast with the 24 lowest-yielding entries which generally had high disease ratings and late heading dates.

#### Crowley:

The Crowley test produced good yields despite heavy rainfall and waterlogged conditions in the fall and early winter. One replication of the test was abandoned (low end of field) and several entries had a second replication of missing data. Stands were estimated in mid winter and all plots with less than a 60% estimated stand were discarded. The yields include two columns of data, the actual mean and a "LS mean".

Least Square Mean is a statistical estimate that takes into account the missing or unbalanced data. Actual means were used in recommendations and across test means tables. DK GR9108 was the highest-yielding (87.8 bu/acre) variety at Crowley, followed by NK/Coker 9152 and USG 3592 which also yielded more than 80 bu/acre.

Fusarium Headblight (FHB, scab) was severe at Crowley. The average FHB rating of 64 entries was only 1.8, but eight entries had FHB scores of 5.0 or greater, where a “0” indicates no disease and a “9” indicates very severe head scab. All of the highly diseased entries had heading dates between 72 and 79 days. FHB infects the wheat heads during flowering and conditions were favorable for infection at the time these entries were flowering. Entries that were earlier or later had reduced levels of FHB. The average leaf rust rating was 10% and 7 entries had at least 40% leaf rust. Minimal levels of stripe rust occurred at the Rice Research Station.

#### **Jeanerette:**

The trial at Jeanerette was lost to heavy rainfall and poor stands.

### **PERFORMANCE OF WHEAT VARIETIES ACROSS NORTH LOUISIANA:**

#### **North Region Means:**

Wheat performance trial data is reported for Alexandria, Bossier City and Winnsboro in 2005. Data from the trial at St. Joseph was highly variable due to poor and variable stands resulting from heavy fall rains.

Terral LA841 and Vigoro McIntosh had the highest-yields across north Louisiana for 2005 (93.8 and 89.8 bu/acre). DK GR9108 and AgriPro/Natchez also yielded greater than 85 bu/acre (Table 6). The average yield of 70 entries was 68.4 bu/acre and the average test weight was 59.7 lbs/bu. Heading date is important, even in north Louisiana. Thirteen of the 15 highest-yielding entries had heading dates between 90 and 97 (March 31 to April 7). Only 8 of 33 entries with above-average yields had heading dates >100, whereas 26 of 37 entries with below-average yields had heading dates >100.

Stripe rust pressure was severe in north Louisiana during the spring of 2005. The average stripe rust rating across three locations and 70 entries was 14% and six entries had >50% stripe rust. Fourteen of the 20 lowest-yielding entries had >25% stripe rust, which shows the impact of stripe rust on yield. The average leaf rust incidence was 3% and only 6 entries had >10% leaf rust.

Terral LA841 had the highest two-year mean yield (93.5 bu/acre) across north Louisiana (Table 7) followed by Vigoro McIntosh and DK GR9108 which also had mean yields > 88 bu/acre. The average yield of 42 entries tested for two years was 72.8 bu/acre and the average test weight was 58.6 lbs/bu. The average heading date was 97 (April 7) and only three entries with heading dates greater than 97 yielded above the test mean. Fourteen of the 15 highest-yielding entries had less than 10% stripe and leaf rust whereas 11 of the 15 lowest-yielding entries had at least 10% stripe or leaf rust.

The performance of 27 entries tested for three years (9 trials) across north Louisiana is shown in Table 8. Five varieties have three-year mean yields of 80+ bu/acre, led by Terral LA841 (89.6 bu/acre) and all had less than 10% stripe or leaf rust. The average

yield of all entries was 75.2 bu/acre and the average test weight was 57.1 lbs/bu. Significant differences occurred among entries for stripe and leaf rust ratings.

### **Alexandria:**

The Dean Lee Research Station wheat trial was excellent in 2005 and produced an average yield for 70 entries of 79.0 bu/acre (Table 9). Terral TV8466 and Terral LA841 yielded over 100 bu/acre and also had 0% stripe or leaf rust. AgriPro/Natchez, Vigoro McIntosh, DK 9577, Progeny 185, DK GR9108 and nine breeding lines also yielded over 90 bu/acre. The average heading date of 70 entries was 95 and only 7 of the 30 highest-yielding entries had heading dates >95. Ten entries had test weights >60 lbs/bu led by AgriPro/APW742 and Pioneer/26R61 with a test weight of 61.9 lbs/bu.

There was some bird feeding damage at Dean Lee, primarily in the earliest-heading entries. Most entries had minimal bird feeding damage. Stripe and leaf rust pressure were moderate at Alexandria.

### **Bossier City:**

Yields were normal at Bossier City in 2005, with an average for 70 entries of 48.5 bu/acre and a range of 17.2 to 72.0 bu/acre. Yields in this table are sorted by descending two-year mean then by one-year mean. Terral LA841 had the highest 2005 and two-year mean yields at Bossier City (72.0 & 83.9 bu/acre). Dixie 9812, Vigoro McIntosh, and four breeding lines had average two-year mean yields of 75+ bu/acre. The average test weight was 59.3 lbs/bu. Pioneer/26R61 and the breeding lines LA9560CA22-1, LA95283CA78, and UGA951216-2E26 had test weights of 62+ lbs/bu.

Stripe rust was severe at Bossier City. The average stripe rust rating was 18% and 13 entries had stripe rust ratings of greater than 50%.

### **St. Joseph:**

The test at St. Joseph produced highly variable data due to heavy fall rains that resulted in erratic stands. The data from this location was discarded

### **Winnsboro:**

The test at Winnsboro produced excellent yields and test weights (Table 11). Vigoro McIntosh was the highest-yielding variety (111.1 bu/acre) followed by DK GR9108 and Terral LA841 with yields of 108 bu/acre. Six breeding lines also yielded over 100 bu/acre. LA95181BUB40-2-2-C had the highest yield of all entries (116.7 bu/acre). The average yield of 70 entries was 78.1 bu/acre and the average test weight was 59.9 lbs/bu. Vigoro McIntosh and DK GR9108 have two-year mean yields greater than 100 bu/acre. Terral LA841 has the highest three-year mean yield.

The average test weight was 59.9 bu/acre. The breeding line LA95283CA78-1-2-B had the highest test weight (63.1 lbs/bu) of all entries. USG 3592 had the highest test weight of all varieties (62.4 lbs/bu) despite having a stripe rust rating of 65%. Stripe rust pressure at Winnsboro was high, with a mean of 17%. Sixteen entries had stripe rust ratings of at least 25% and 9 higher than 50%.

## **STATEWIDE PERFORMANCE OF WHEAT VARIETIES:**

Table 12a gives the average performance of 64 wheat entries tested across all five locations in 2005. Table 12b includes all 70 entries tested in 2005, has yields for individual locations and regions, and is sorted by north Louisiana mean yield. Terral LA841 has the highest mean yield (89.3 bu/acre) across five locations for 2005, followed by DK GR9108 (86.6 bu/acre) and Vigoro McIntosh (83.6 bu/acre). All three varieties showed very good resistance to leaf and stripe rust.

The average test weight was 58.8 lbs/bu. Pioneer 26R61 had the highest test weight (61.2 lbs/bu) of all varieties. There were significant differences among entries for stripe rust and leaf rust incidence.

Thirty-six entries were tested for two years across all Louisiana locations (8 trials). Terral LA841 had the highest two-year mean yield (89.6 bu/acre) of all varieties followed by DK GR9108 and Vigoro McIntosh (Table 13). Four "LA" breeding lines also had two-year mean yields greater than 80 bu/acre.

Twenty-one entries have been tested across Louisiana for three years (Table 14). Terral LA841 had the highest three-year mean yield followed by AgriPro/Panola (80.7 bu/acre). The average test weight was 57.3 lbs/bu. The highest stripe rust rating was 43% and nine entries had stripe rust ratings of 0% or 1%.

## **OTHER WHEAT TRIALS:**

Tables 15 and 16 contain results for 41 entries tested in the 2005 USDA Uniform Southern Soft Red Winter Wheat Nursery at Baton Rouge and Winnsboro. The average yield at Baton Rouge was 59.9 bu/acre and the average yield at Winnsboro was 62.7 bu/acre.

The Wheat Screening Nursery is a two-location, two-rep trial conducted at Baton Rouge and Winnsboro. There is a much smaller fee for this trial and the intent of the trial is to give companies an opportunity to see if experimental lines might be adapted to Louisiana before entering the full statewide trials. The 2005 wheat screening nursery contained 17 experimental lines and four check varieties. The average yield of 21 entries at Baton Rouge was 60.8 bu/acre. AWD01\*7759 (AgriPro) had the highest yield (78.0 bu/acre) and showed pretty good resistance to stripe and leaf rust. NKB017009 also had a good yield and an excellent test weight. Terral LA841 was the highest-yielding check variety (72.4 bu/acre).

Terral LA841 had the highest yield in the wheat screening nursery at Winnsboro (Table 18). AWD01\*7759 also performed well. AWD02\*8486 had a test weight of 63.7 lbs/bu.

## **PERFORMANCE OF OAT VARIETIES**

### **PERFORMANCE OF OAT VARIETIES ACROSS LOUISIANA:**

Oat variety trials were conducted at Baton Rouge, Bossier City, and Winnsboro during the 2004-05 season. The trial included 8 commercial varieties and 21 breeding

lines (Table 19). Data from Bossier City was not used due to high variation caused by fall rains and poor stands. Five “LA” breeding lines had average yield greater than 150 bu/acre across Baton Rouge and Winnsboro. Three sister lines, LA95006’s had the highest yields and also excellent crown rust resistance. TAMO 405 had the highest yield of released varieties (133.1 bu/acre) and also showed excellent crown rust resistance. The average yield of 29 entries was 115.3 bu/acre and the average test weight was 34.9 lbs/bu.

Test weights were excellent due to dry weather in April during grain fill and maturation. Crown rust pressure was heavy but most of the entries were resistant to prevalent races. The cultivars Brooks and Secretariat LA495 had 96% and 71% crown rust respectively, while 13 entries had 0% crown rust. TAMO 397, which had a crown rust rating of 14%, has been resistant to crown rust races in Louisiana until this year.

LA96006BSB-270-S2-C had the highest two-year mean yield (135.1 bu/acre) along with above-average test weight and 0 ratings for crown rust and stem rust (Table 20). Plot Spike LA9339, TAMO 405, and Horizon 321 were the highest-yielding commercial varieties and all three had good crown and stem rust resistance. Plot Spike LA9339, Horizon 321, and TAMO 397 had the highest three-year mean yields.

#### **Baton Rouge:**

LA96006BSB-270-S2-C has a yield of 151.5 bu/acre at Baton Rouge (Table 21), a test weight of 36.1 lbs/bu, and excellent crown rust and lodging ratings. Seven entries yielded above 125 bu/acre. The average yield was 96.1 bu/acre and the lowest yield was 4.6 bu/acre. TAMO 405 was the highest-yielding commercial variety at Baton Rouge. Test weights were excellent with an average of 33.9 lbs/bu. Crown rust pressure was high with a mean of 13% and a high of 93%. Stem rust pressure was low. It is obvious that crown rust dramatically impacted yield. The six lowest-yielding entries had the six highest (worst) ratings for crown rust and also the lowest test weights.

#### **Bossier City:**

The Bossier City test data was discarded due to a high level of variation caused by reduced stands resulting from fall rainfall.

#### **Winnsboro:**

Oat yields at Winnsboro were excellent, with an average of 131.9 bu/acre (Table 22). TAMO 397 was the highest-yielding (167.9 bu/acre) commercial variety followed by Horizon 474 (143.1 bu/acre). LA96006BSB-270-S2-C had the highest overall grain yield (194.9 bu/acre). Crown rust pressure was heavy at Winnsboro with a mean of 19% and a high of 100%. The four lowest-yielding entries also had the highest crown rust ratings and the lowest test weights. The average test weight, 35.6 lbs/bu, is quite high and resulted from dry weather during grain fill.

LA96006BSB-270-S2-C has the highest yield (152.0 bu/acre) at Winnsboro and also at Baton Rouge. 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.

### **Preliminary Oat Yield Trial ‘A’ and ‘B’:**

Tables 23, 24, and 25 show the performance of 11 advanced oat breeding lines and three check varieties in Prelim-A at Baton Rouge and Winnsboro. Four “LA” breeding lines had higher yields than Horizon 321, the highest-yielding check variety. Nine of 14 entries had less than 5% crown rust, whereas the susceptible check Brooks had 88% average crown rust and a yield of only 35.2 bu/acre.

Oat Prelim-B precedes Prelim-A in variety development and is only grown at Baton Rouge. Oat prelim-B contained 70 entries in 2005 but only 20 were selected for harvest based on disease reaction, lodging resistance, and general appearance. The average yield of these 20 entries was 113.4 bu/acre and the average test weight was 36.8 lbs/bu (Table 26). LA02079-S-B-69-S2 had a mean yield of 152.7 bu/acre. It is a short, early-heading line and has excellent crown rust resistance. LA9917SBSBSB-31-B-S-B-S1 had a yield of 141.9 bu/acre coupled with a test weight of 39.9 lbs/bu and 0% crown 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 average yield of 24 entries was 63.6 bu/acre (Table 27) with a range of 0.0 to 151.8 bu/acre. The three check varieties were out-yielded by 11 breeding lines, including LA96006BSB-270 and LA9810SBS-58 which had the highest grain yields. There were a number of very susceptible lines in this trial and the average crown rust rating was 46%. Nine of the 10 highest-yielding lines also had 0% crown rust and the nine lowest-yielding lines had 95%+ crown rust. The average test weight 34.4 lbs/bu is deceiving because the nine lowest-yielding lines did not produce enough grain to measure test weight.