# Wheat Variety Performance and Production Practices in Louisiana

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The 2015 wheat production season was very challenging for growers across the region, primarily due to excessive rainfall during the spring that resulted in poor yields, low test weight, lodging, and high levels of Fusarium headblight. Much of our planted wheat acreage was abandoned as a result. Results of the 2015 wheat trials are summarized in Table A (South Louisiana) and Table B (North Louisiana).

***Variety selection:***

Choice of varieties for planting is a crucial management decision that sets the stage for yield potential and input costs. Since the 2015 season was atypical and yields were poor, growers should place more emphasis on yield means over two or even three years within their region (North or South Louisiana). While grain yield is the most important factor, test weight, disease resistance, and heading date are also important considerations as they also impact economic return.

Test weight is important because low test weights result in dockage at the elevator. Heading day is an indication of cold requirement (vernalization) and day length (photoperiod) requirement that determines when a variety heads out. Some varieties head very late or not at all in south Louisiana due to a long vernalization requirement or photoperiod response, while those same varieties perform well in north Louisiana. As can be seen in Tables A and B, late-heading varieties generally perform poorly in south Louisiana. By contrast, early-heading varieties sometimes perform poorly in north Louisiana due to spring freeze damage. Disease resistance protects yield and reduced input costs. Vernalization and photoperiod response are the primary reasons for dividing Louisiana into North and South regions.

Early-heading and maturing varieties permit earlier harvest and timelier planting in a double-cropping system, while later-heading varieties guard against damage from a late spring freeze and can be planted earlier in north Louisiana. Early-heading varieties should be planted in the second half of the recommended planting window to avoid the likelihood of spring freeze damage. Lodging resistance helps guard against test weight decreases and yield loss that can result from near-mature heads laying on the ground from storms.

Disease susceptibility is very important in terms of yield and profitability. The 2015 season was notable for the severe Fusarium headblight (FHB) epidemic that occurred as a result of prolonged rainfall during flowering. There are no varieties fully resistant to FHB but some varieties have a moderate level of resistance that helps reduce losses. It should be noted that varieties less susceptible to disease may not always produce the highest yields, especially if disease pressure is not present. However, in high disease pressure situations, the resistance may result in higher yields as well as enhanced profitability by saving the costs of fungicide applications.

Triazole fungicides may suppress FHB. In earlier research tebuconazole (Folicur and generics) reduced incidence and severity of FHB. Prosaro (prothioconazole + tebuconazole), Proline (prothioconazole), and Caramba (metconazole) was somewhat efficacious on FHB in other studies. When applications are made under ideal conditions, one can expect a maximum of 50% control. On average, 40% control is more realistic.

Timing is critical. Essentially, we have a short window during flowering to make an effective application for FHB. The biggest problem is that ideal conditions (wet weather) for FHB infection are not ideal for making fungicide applications. Head coverage is also critical. Sprayers should be calibrated to deliver maximum water volume (minimum 15 GPA by ground, 5 GPA by air) and optimal droplet size (300 to 350 microns). For ground sprayers, nozzles angled at 30° to the horizontal may maximize head coverage. Some research has shown that dual nozzles angled in opposite directions will also increase head coverage.

It is common to see 2-3 years of epidemics of FHB followed by years with little to no disease. If similar weather conditions are encountered next year during flowering, expect to encounter FHB again in 2016. An online (www.wheatscab.psu.edu) risk assessment tool that is based on temperature and relative humidity is available online, which has regional commentary that will help you to determine your risk at a given location next year.

***Crop management:***

Planting dates for Louisiana wheat depend on location and variety. For southern and central Louisiana optimum planting dates range from November 1 through November 30. The optimum planting for northern Louisiana is slightly earlier, ranging from October 15 through November 15. Early-heading varieties should generally be planted after the mid-date, while late-heading varieties can be pushed a little on the early side of the planting window. The weather in north Louisiana is cooler in the fall and early winter, which slows growth and prevents excess winter growth. It is important that the wheat crop be well-established and fully tillered before going dormant in the coldest part of the winter. Additionally, because of the cooler conditions, the threat for fall pests (Hessian fly, army worms and rust) are decreased earlier in the fall compared to south and central Louisiana. While these dates are the optimum planting window averaged over years, the timing will vary in some years depending on weather patterns. Additionally, if wheat cannot be planted within these optimum windows, planting later than the optimum window is usually better than planting too early. Early planting can result in greater insect and fall rust establishment and also makes plants more prone to spring freeze injury due to excessive fall growth and development. Planting too late (more than 14 days after the optimum window) can result in significant yield loss of due to slow emergence, seed rotting and decreased tillering period, which can results in fewer and smaller heads.

Wheat can be planted by broadcasting seed and incorporating; however, it is preferred that the seed be drilled. Drilling the seed increases the uniformity of depth and stand. Use recommended planting rates for drilled wheat (60 to 90 lb/A) or broadcast wheat (90-120 lb/A) of quality seed into a good seedbed with adequate moisture. This higher seeding rate should be adapted for conditions in which high germination or emergence is not expected, as with late-planted wheat or heavy, wet soils. Late-planted seed should be planted at a higher seeding rate using a drill to ensure rapid, adequate and uniform emergence.

Good surface drainage is critical to successful wheat production. Saturated fields lead to diseases such as root rots and downy mildew, reduce tillering and vegetative growth, and decrease root development and nutrient utilization. Yields in wheat fields suffering from waterlogging stress are greatly reduced. Field with marginal drainage should be ditched to ensure that water stands for a minimum time after heavy rainfall.

Nitrogen (N) fertilization of wheat can be a challenging aspect of production. Total N application should normally range from 90 to 120 pounds per acre, but this will vary depending on soil type and rainfall after applications. Timing of N application depends on several factors. The wheat crop needs adequate N in the fall and early winter to establish ground cover and properly tiller; however, excessive levels of fall N can result in rank growth and increased lodging potential, as well as a higher probability of spring freeze damage from early heading. If the wheat crop is following soybeans, soil residual or mineralizable N should be adequate for fall growth, and no pre-plant N is needed. However, if the wheat crop follows corn, sorghum, rice or cotton, the application of 15 to 20 pounds of N per acre would typically be beneficial. Where the wheat crop is planted later than optimum, additional N may be necessary to ensure adequate fall growth prior to winter conditions. If the wheat crop did not receive a fall application and appears to be suffering from N deficiency in January, the initial topdress N application can be made early to promote additional tillering. Early spring is when the majority of N for the wheat crop should be applied. There is no universal rule on how early spring N should be applied. Each field should be evaluated based on tillering, stage of development, environmental conditions and crop color. A crop that has good growth and good color should not need N fertilization prior to erect leaf sheath (Feekes 5), usually sometime in February. However, first spring fertilizer application should be applied prior to first node (Feekes 6) in order to ensure optimum head development, tiller retention and head size. Crop N stress around jointing (Feekes 6) will result in yield losses. Any additional N applied following flag leaf typically contributes very little to crop yield. Splitting topdress N into two or three applications is common in Louisiana production systems due to the increased risk of N losses often associated with heavy rainfall and our long growing season. Splitting N typically occurs by applying fertilizer N at or just prior to jointing with a second application occurring 14 to 28 days later. About 50 percent of the topdress N is normally applied with the first split, but this may be decreased if the first split is put out early and plants are not well enough developed to take up that much N.

Phosphorus, K, and micronutrients should be applied in the fall based on soil test reports. All fertilizers applied as well as lime should be incorporated into the soil prior to planting. Required lime should be applied as soon as possible because it takes time for the lime to begin to neutralize the acidity of most soils. The application of sulfur is a growing concern in Louisiana production systems, with increasing deficiencies appearing every year. Oftentimes, early spring sulfur (S) deficiencies are mistaken for N deficiencies and additional S is not applied. Because sulfur is mobile, similar to N, the application solely in the fall will not be adequate. Supplemental applications of S with spring N applications are often warranted.

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Adapted from an article written by Dr. Josh Lofton in 2014

**Table A. Performance of commercially available wheat varieties across South Louisiana.**

| | Grain Yield | | Test Weight | | Head Day | | Plant Height | | Lodging Score | | Stripe Rust | | Leaf Rust | | Fusarium Hd Blight | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2-yr 2015 bu/acre | | 2-yr 2015 lbs/bu | | 2-yr 2015 of yr | | 2-yr 2015 in | | 2-yr 2015 0-9 | | 2-yr 2015 % | | 2-yr 2015 % | | 2-yr 2015 0-9 | |
| USG 3120 | 67.3 | 36.4 | 54.3 | 45.9 | 87 | 87 | 34 | 34 | 1.7 | 3 | 0 | 0 | 0 | 0 | 3.3 | 2.1 |
| TERRAL LA754 | 66.9 | 41.0 | 55.1 | 48.4 | 90 | 90 | 34 | 34 | 0.8 | 1 | 0 | 0 | 7 | 10 | 3.5 | 2.0 |
| AGS 2035 | 66.3 | 40.9 | 55.4 | 48.1 | 90 | 90 | 36 | 35 | 1.1 | 2 | 0 | 0 | 0 | 0 | 3.7 | 2.0 |
| JAMESTOWN | 64.3 | 35.1 | 55.2 | 46.9 | 88 | 89 | 31 | 32 | 2.4 | 4 | 0 | 0 | 0 | 0 | 1.9 | 1.6 |
| DYNA-GRO SAVOY | 64.1 | 41.7 | 54.2 | 46.4 | 86 | 86 | 31 | 31 | 3.2 | 5 | 0 | 0 | 0 | 0 | 3.7 | 2.3 |
| AGS 2038 | 64.0 | 34.0 | 54.6 | 46.9 | 94 | 94 | 37 | 35 | 1.5 | 3 | 0 | 0 | 0 | 0 | 4.0 | 2.3 |
| AGS 2060 | 62.5 | 42.5 | 54.3 | 45.2 | 88 | 87 | 35 | 37 | 2.4 | 4 | 0 | 0 | 18 | 30 | 2.1 | 1.4 |
| PIONEER 26R94 | 62.3 | 33.8 | 55.3 | 47.1 | 89 | 89 | 36 | 36 | 1.7 | 3 | 0 | 0 | 0 | 0 | 3.3 | 0.9 |
| AGS 2040 | 62.0 | 45.5 | 55.8 | 49.1 | 87 | 87 | 32 | 32 | 1.4 | 2 | 0 | 0 | 0 | 0 | 1.0 | 0.0 |
| SYNGENTA SY CYPRESS | 61.5 | 34.8 | 54.2 | 45.7 | 88 | 88 | 31 | 30 | 2.2 | 4 | 0 | 0 | 5 | 6 | 1.2 | 0.0 |
| PIONEER 26R41 | 59.3 | 27.9 | 53.4 | 45.6 | 100 | 101 | 31 | 31 | 1.4 | 2 | 0 | 0 | 2 | 2 | 1.5 | 0.0 |
| L-BRAND-343 | 57.6 | 30.4 | 55.0 | 47.2 | 93 | 94 | 30 | 31 | 1.5 | 3 | 0 | 0 | 0 | 0 | 4.5 | 2.3 |
| TERRAL LA841 | 57.1 | 31.7 | 53.4 | 45.6 | 91 | 92 | 33 | 34 | 1.9 | 3 | 0 | 0 | 0 | 0 | 2.9 | 0.4 |
| DYNA-GRO BALDWIN | 56.8 | 26.5 | 54.3 | 46.9 | 96 | 96 | 36 | 36 | 0.8 | 1 | 0 | 0 | 0 | 0 | 3.2 | 1.1 |
| DYNA-GRO OGLETHORPE | 55.4 | 27.3 | 52.4 | 43.0 | 90 | 92 | 32 | 32 | 4.5 | 7 | 0 | 0 | 0 | 0 | 1.7 | 0.0 |
| PROGENY 125 | 55.3 | 24.6 | 52.8 | 45.8 | 91 | 91 | 33 | 34 | 3.4 | 6 | 2 | 2 | 18 | 0 | 1.9 | 0.9 |
| DYNA-GRO 9171 | 53.9 | 18.5 | 50.5 | 39.2 | 99 | 100 | 32 | 32 | 1.7 | 3 | 0 | 0 | 16 | 9 | 1.2 | 0.0 |
| AGS 2027 | 51.4 | 21.7 | 52.4 | 43.5 | 92 | 93 | 31 | 32 | 4.1 | 7 | 0 | 0 | 0 | 0 | 2.3 | 0.0 |
| PROGENY 870 | 50.4 | 14.4 | 52.7 | 45.0 | 100 | 101 | 31 | 30 | 1.5 | 3 | 0 | 0 | 14 | 11 | 1.3 | 0.2 |
| USG 3404 | 46.7 | 10.7 | 50.2 | 38.5 | 100 | 102 | 32 | 30 | 2.7 | 5 | 1 | 1 | 9 | 8 | 1.3 | 0.0 |
| GO WHEAT 2058 | | 30.6 | | 48.0 | | 99 | | 28 | | 2 | | 4 | | 29 | | 0.4 |
| USG3225 | | 29.0 | | 45.2 | | 94 | | 31 | | 3 | | 0 | | 0 | | 1.3 |
| USG3895 | | 25.2 | | 47.4 | | 98 | | 30 | | 3 | | 0 | | 1 | | 1.5 |
| HILLIARD | | 22.0 | | 44.5 | | 96 | | 33 | | 3 | | 0 | | 4 | | 0.9 |
| SYNGENTA SY VIPER | | 21.6 | | 44.8 | | 95 | | 35 | | 5 | | 0 | | 10 | | 2.4 |
| AGRIMAXX 415 | | 16.2 | | 44.4 | | 101 | | 31 | | 4 | | 0 | | 10 | | 0.0 |
| PROGENY 410 | | 14.9 | | 45.9 | | 97 | | 35 | | 4 | | 1 | | 19 | | 0.7 |
| DELTA GROW 2700 | | 13.3 | | 44.9 | | 101 | | 32 | | 4 | | 2 | | 24 | | 0.0 |
| DYNA-GRO 9522 | | 13.0 | | 45.9 | | 102 | | 32 | | 5 | | 0 | | 18 | | 0.5 |
| AGRIMAXX 447 | | 12.8 | | 47.2 | | 103 | | 33 | | 2 | | 1 | | 0 | | 0.0 |
| AGRIMAXX 446 | | 12.3 | | 48.2 | | 103 | | 30 | | 3 | | 1 | | 45 | | 0.2 |
| AGRIMAXX 444 | | 11.0 | | 47.9 | | 101 | | 30 | | 5 | | 1 | | 31 | | 0.0 |
| **MEAN** | **59.1** | **28** | **53.8** | **46** | **93.0** | **95** | **33.0** | **33** | **2.1** | **3** | **0** | **0** | **7.0** | **9** | **2.4** | 0.9 |
| **CV%** | **11** | **19.0** | **7** | **10.0** | **1** | **1.0** | **5** | **5.0** | **66** | **48.0** | **293** | **308** | **189** | | **48.0** | |
| **LSD (0.10)** | **9.9** | **8.3** | **2.0** | **4.1** | **1.8** | **3** | **0.6** | **2** | **1.6** | **2.1** | **NS** | **2** | **NS** | | **1.9** | |

Fusarium Headblight is wheat scab rated ona scale of 0 - 9, where a lower number indicates less head scab. Scab is somewhat weather dependent and later-maturing varietes probably have lower ratings due to escape rather than resistance.

Lodging: 0 indictaes none and 9 indicates severe lodging.