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Wheat Update 2011

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ARKANSAS WHEAT PERFORMANCE TRIALS AND VARIETY SELECTION

Wheat performance trials were conducted during the 2010-2011 growing season to provide information about yield potential, agronomic characteristics, and disease reaction of commercially available varieties of wheat. Variety selection is important for successful wheat production. This publication is designed to help producers select adapted, high-yielding, and disease-resistant varieties.

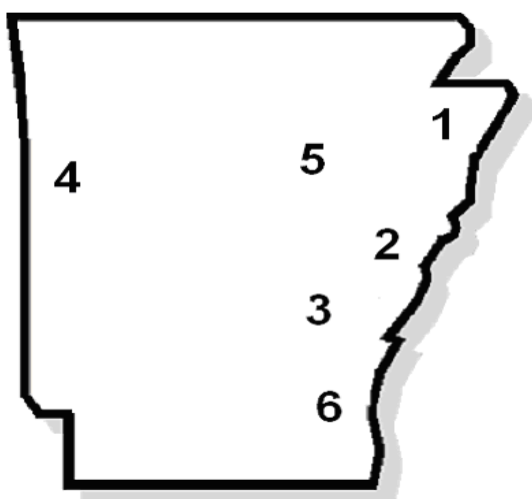

FIGURE 1. LOCATIONS OF ARKANSAS WHEAT PERFORMANCE TESTS, 2009-11

1 – Northeast Research and Extension Center, Keiser – Sharkey Silty Clay

2 – Lon Mann Cotton Research Station, Marianna – Loring Silt Loam

3 – Rice Research and Extension Center, Stuttgart – Crowley Silt Loam

4 – Vegetable Substation, Kibler – Roxanna Silt Loam

5 – DID Farms, or Newport Station – Beulah Fine Sandy Loam

6 – Southeast Branch Station, Rohwer – Sharkey/Desha Silt Loam

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Methods

Wheat varieties and experimental lines were entered by commercial and public institutions and evaluated for an unbiased comparison of their performances. In general, recommended cultural practices were used for the **standard input trials**. In the **high input trial** plots received an additional 30 pounds of spring nitrogen fertilizer and a foliar fungicide was applied at flag leaf emergence to provide information on varietal performance under intensive management strategies employed by some Arkansas farmers.

Each trial consisted of 82 varieties and experimental lines replicated four times in a randomized complete block design. A seeding rate of 105 lb/A was used for all varieties at each location. Recommended weed control practices were exercised as needed. Plots were harvested with a small plot combine to determine yields, which were adjusted to 13 percent moisture. For further details concerning methods, consult the *Small-Grain Cultivar Performance Tests 2010-11*, Arkansas Agricultural Experiment Station, located at www.arkansasvarietytesting.com.

Wheat yields from the 2000-11 growing season are reported in Table 1 and two-year average yields are reported in Table 2. Three-year average yields, when available, are reported in Table 3. Disease reactions of many commercially available varieties are listed in Table 4. Some varieties have not been tested in Arkansas long enough to obtain reliable ratings for each disease. Agronomic data such as test weight, plant height, lodging, heading date, and relative maturity for selected varieties tested in 2010-2011 are found in Table 5.

Variety Selection

Variety selection is an important management decision in wheat production. The variety selected influences other management input that may be necessary during the season. Wheat yields are influenced by the adaptation of the variety and how well that variety is managed to maximize its yield potential. Yield potential, maturity, test weight, and disease reaction are important factors in selecting a variety. No variety is superior to all other varieties under all circumstances. Thus, growing two or more varieties with differing maturity is recommended. Growing two or more varieties not only spreads the risks from adverse environmental factors but also can spread management operations such as harvesting.

The performance of a variety differs according to test site and year. While the yield data from all locations may be helpful, the data from locations closest to your farm may be the most meaningful. Since some varieties are more adapted to certain soil types, studying the yields at the location with a soil type similar to yours is suggested. Each year, the relative performance of varieties at a location changes depending on the weather and disease conditions during the year. Since the goal of variety selection is to pick the variety that performs well the next year, a yield averaged across years more likely predicts future performance than the yield from a single season. Therefore, looking at two- and three-year average yields rather than yield from any particular season is important. (See Tables 2 and 3)

Variety Adaptation

Adaptation is a combination of all of the attributes of a variety grown in a particular environment. The long-term average yield at a site is a good indication of its adaptation in that area. When studying yield data to determine if a variety is adapted, take into account whether your location is farther north or south than the test site.

Maturity

Variety maturity is a very important factor to consider when selecting varieties. Producers should select several different varieties with differing maturity to reduce risks for a late spring freeze. Early maturing varieties typically should not be planted early in the planting season. These varieties do not have much of a vernilization requirement and can begin jointing very early in the spring, which increases the likelihood of freeze injury from a late spring freeze. Late maturing varieties require a greater vernilization period and generally do not begin to joint as quickly as early maturing varieties. An ideal planting order by maturity would be to plant late maturity varieties first, medium maturity varieties second and early maturing varieties last.

Test Weight

Test weight is important since growers receive substantial discounts for low test weight. The test weight of wheat is determined by both environmental and genetic factors. Some varieties have characteristically higher test weights than others. Thus, when environmental conditions cause poor test weights, varieties with high test weight potential usually have heavier test weights than other varieties.

Insect Resistance

The **Hessian fly** has been a problem in scattered fields of central and northeast Arkansas in previous years. The predominant Hessian fly present in Arkansas is Biotype 'L'. **Delayed planting** is a recommended practice for avoiding Hessian fly problems. Contact your county Extension office for further management information regarding Hessian fly management.

Lodging Resistance

Lodging resistance is important to prevent yield losses and to allow for efficient harvest. Three factors are important in lodging – plant height, straw strength, and level of fertility. Typically, shorter varieties are more resistant to lodging, but strength of the straw allows many taller varieties to stand well. Lodging tends to be more severe at high nitrogen levels. Varieties with low lodging scores and high yields are preferred. Lodging ratings are shown in Table 5.

Wheat Disease Management in Arkansas 2011

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University of Arkansas Division of Agriculture

Management recommendations attributed to research conducted in Arkansas were funded in part by wheat check-off funds administered by the Arkansas Wheat Promotion Board.

Further information on wheat fungicides can be found at http://www.uaex.edu/Other_Areas/publications/HTML/MP-154.asp

There are several wheat diseases with potential to reduce yield and test weight in the Mid-South. Most are caused by fungi, a few by viruses, and one by a bacterium.

Foliar and Head Diseases

Stripe rust

Since 2000, stripe rust has been the most important foliar disease in Arkansas. The fungus causing stripe rust spreads by airborne spores that may land in wheat fields any time during the growing season. Spores arriving in the fall pose the greatest threat because the fungus prefers cool temperatures and the disease has a long time to develop. A single infection in the fall can start several cycles of spore production and produce a visible "hot spot" by late March to early April. Hot spots are areas of infected wheat plants up to several yards in diameter where leaves are heavily diseased, and these areas appear yellow from a distance. Spores from hot spots spread downwind quickly to other portions of the field and to other fields. The most favorable conditions for stripe rust are cool temperatures from 40-60º F with sunny, windy days (to spread spores) and clear, calm nights favoring long periods of dew on leaves (moisture is needed for spores to germinate and infect leaves). Rainfall also can provide the moisture for germination and infection. Stripe rust will remain active until night temperatures stay above about 65º F consistently and may even damage the heads of some varieties. **Resistant varieties are important for managing stripe rust** and many varieties have some level of adult-plant resistance that limits stripe rust compared to susceptible varieties. **Varieties rated "Very Susceptible" in our ratings should not be planted in Arkansas**. All fungicides listed in the latest MP154 publication are effective against stripe rust, if applied properly. Check with your local Cooperative Extension Office for the MP154 publication or other current information on wheat fungicides. A fungicide application will likely be profitable if stripe rust develops before flowering (Feekes growth stage 10.5) and the field has good yield potential (> 40 bu/A). If stripe rust becomes active during early spring in your area, it is extremely important to keep a close eye on good wheat fields and spray an approved fungicide as soon as possible after "hot spots" of stripe rust have been noted in a field. Stripe rust can be very fast moving under typical early spring (late March to late April) weather conditions in the South. Earlier applications (as soon as hot spots are noted) are much more effective than applications made too late, and fungicides are more effective on varieties that are not considered "VERY SUSCEPTIBLE". Strobilurin fungicides (e.g. Quadris and Headline) are more effective if applied BEFORE infection is evident (preventative) while triazole fungicides (e.g. Tilt, Propimax, Bumper and strobilurin+triazole mixtures like Quilt and Stratego) are effective both as preventatives (before infection is evident) or as curatives (after infection is evident). It is important to use a fungicide containing a triazole (propiconazole) on fields with obvious hot spots and remember it will take 3-7 days before the disease stops increasing after treatment in these fields. **On very susceptible varieties, two applications of fungicide will be necessary to control stripe rust under favorable conditions – another reason not to plant these in Arkansas.**

Leaf rust

Leaf rust used to be the most important wheat disease until stripe rust became more common. It develops similar to stripe rust except that it requires warmer temperatures (60-80º F) and usually does not overwinter in Arkansas, especially north of I-40. The likelihood of overwintering increases further south, and leaf rust survives the winter almost every year in parts of Louisiana and Texas. Spores from these areas usually blow northwards into Arkansas and other states in the spring. If the spores arrive by early April, the disease will have a long time to develop and is likely to cause yield and test weight losses. During the past several years, however, leaf rust spores have arrived too late to cause much damage in Arkansas. Management of leaf rust is similar to that for stripe rust, except that leaf rust is less destructive, and fungicides are thus less likely to be profitable in most years. Again, earlier applications (boot to early heading stage) usually are much more effective than later applications (just before flowering). Since this disease has become more erratic year to year, it is important to scout wheat in the spring before fungicide decisions are made.

Septoria leaf blotch (Leaf Blotch)

This disease usually can be found in every wheat field during the winter and spring. Leaves are infected during the fall, and leaf lesions develop on the lowest leaves (usually leaves in contact with the soil) by green-up in the spring. Lesions are irregular-shaped, tan to brown dead areas usually with some part of the lesion having parallel (straight) sides. Prominent (easily seen) black fruiting bodies develop in lines within the lesions. The fruiting bodies are visible to the eye at arm's length and produce spores that are splashed by rain to new leaves. Continued disease development during the spring requires windy, rainy weather to spread spores and provide favorable conditions for infection. Under moist conditions, a mass of spores may be seen with a hand lens, emerging from the top of fruiting bodies like toothpaste squeezed from a tube. Leaf blotch causes significant yield loss only when the top two leaves (flag and flag-1 leaves) become diseased before grain is filled.

Leaf blotch is best managed by growing moderately resistant varieties that limit disease development. A fungicide application may be needed if lesions are common by boot stage and yield potential is high. However, dry weather will stop further disease development with or without a fungicide and this has happened most springs the last few years. All registered fungicides listed in the MP154 are effective against leaf blotch, and boot stage (before upper leaves become infected) usually is the best time to make an application.

Stagonospora (formerly Septoria) leaf and glume blotch (Glume Blotch)

This disease can be difficult to find on leaves before heading because most infections do not produce leaf lesions right away, and lesions that do develop may look like other problems. Early symptoms occur as brown spots on lower leaves that develop into tan to brown, elliptical lesions with a yellow border. Gray-brown fruiting bodies of the fungus develop in the center of these lesions, but they are mostly embedded in the leaf tissue and difficult to see without at least a 10x hand lens. As with Septoria leaf blotch, disease development is favored by windy, rainy weather, but this disease develops better at warmer temperatures. Under favorable conditions, a flush of leaf and glume symptoms seems to appear overnight after heading. Glume lesions are gray-brown, progress downward from the tip of glumes, and have more visible fruiting bodies that look like dark pimples.

The fungus causing Stagonospora leaf and glume blotch is seedborne, and research in Arkansas showed that seedborne inoculum is responsible for a large number of initial infections. Seed treatments containing Dividend or Raxil fungicides are effective for reducing seedling infection and the level of disease the following spring. All registered foliar fungicides in the MP154 are also effective, but they need to be applied before heading to prevent lesions on the upper leaves. Without lesions on upper leaves, there will be few spores to infect the glumes. Early boot stage is the best time to make a fungicide application. Varieties differ in resistance to this disease, but little reliable information is available on the relative resistance of current varieties.

Tan spot

This disease is a relatively new problem in Arkansas and is highly associated with continuous wheat production using minimum or no-till production practices. Spores that infect a new wheat crop come from fruiting bodies that develop in infected wheat straw on the soil surface. The fruiting bodies are black "bumps" protruding above the surface of the straw that feel like coarse sandpaper or braille dots if the straw is pulled between your thumb and finger. If tan spot is a problem, straw with fruiting bodies will always be found nearby. Spores produced in these fruiting bodies are blown to young wheat plants throughout the fall and spring whenever temperatures are mild and moisture is available and cause lesions on lower leaves. These lesions then produce a different type of spore that is carried by both wind and splashing rain to upper leaves as plants grow. The name "tan spot" is confusing because the lesions are actually oval-shaped with a brown center and yellow border. Lesions tend to merge together to form irregular blotches that can be distinguished from Septoria or Stagonospora blotches by the absence of fruiting bodies in the lesions (spores on leaves are produced without fruiting bodies). Actual tan or off-white spots with more uniform shapes on wheat leaves in the spring may be the result of paraquat herbicide drift.

Tan spot can be managed by tillage or burning to destroy infected wheat straw before planting, growing resistant varieties, or applying any of the registered fungicides. A fungicide application should be timed to protect upper leaves from infection, and boot stage likely would be a good time.

Powdery mildew

This disease has always been common on lower leaves early in the spring in Arkansas, but usually it did not progress up the plant, except on a few occasions. Beginning in 2006, however, powdery mildew has become more severe throughout Arkansas. Powdery mildew is favored by susceptible varieties, thick and lush wheat stands from over-application of nitrogen, wheat on sandy soil that goes through several cycles of drought stress, and prolonged periods of favorable weather in winter and spring. Symptoms appear as tufts of white mycelium and spores that can be rubbed off leaves. Leaf tissue will be yellow beneath the tufts.

Until recently, no special management practices for powdery mildew were necessary. Now it would be wise to avoid susceptible varieties. All registered fungicides are at least moderately effective, and a fungicide application can be made to protect upper leaves and heads if needed.

Bacterial streak / black chaff

This is the only important bacterial disease of wheat in the Mid South. Research in Arkansas showed that the bacterium does not survive in the field over summer between wheat crops and that seeds are the most important source of inoculum. However, there is a poor association between the level of seedborne inoculum and level of disease in the subsequent wheat crop. The bacterium causing this disease can multiply very quickly on the plant surface and inside wheat leaves, and disease development is more dependent on weather conditions during the early spring than on the level of seedborne inoculum. The earliest symptoms usually develop on leaves in the spring during jointing and appear as defined water-soaked, long, thin lesions that turn brown in a day or two. About flowering time, there is a flush of lesions on the upper leaves that usually merge together to kill portions of leaves. Lesions tend to occur where a leaf bends because dew persists longer at these spots and at the margins of leaves where there are openings that allow the bacteria to enter. Usually these leaf lesions develop as streaks between veins and do not expand much after the flush of symptoms. During the grain fill period, black chaff symptoms develop on glumes and peduncles (stem below the head) as black streaks between veins. Severely diseased plants produce shriveled grain.

Bacterial streak / black chaff is best managed by planting seed that is not infested with the bacterium. However, there is currently no practical means of testing seed lots for the bacterium or eliminating the bacterium from seed lots. Seed from diseased fields should not be used for planting, but there is no way to tell if there was disease in the field once the seed is harvested. Varieties differ in their resistance to bacterial streak / black chaff, but there are no reliable ratings for current varieties. Fortunately, this disease has not been a big problem since the early 1990s.

Loose smut

This disease is caused by a fungus that infects individual wheat flowers and then remains dormant in a healthy-looking seed until the seed germinates. As the plant grows, the fungus infects all of the developing heads of the plant and transforms the heads into a mass of black spores that are carried by the wind to infect neighboring plants at flowering time. Infected plants are shorter than healthy plants, so it is necessary to look lower in the canopy to find smutted plants. After all of the spores blow away, stems are left with a bare rachis (top of the stem that would normally hold the seeds).

Loose smut is best managed by fungicide seed treatments containing Dividend or Raxil. If all seed used to produce foundation and certified seed were treated, then the incidence of loose smut would be negligible in certified seed. Varieties may differ for resistance to loose smut, but there are races of the fungus similar to races of rust, and breeding programs no longer select for loose smut resistance because seed treatment is highly effective and relatively inexpensive.

Fusarium head blight (scab)

Fusarium species capable of causing scab are very common, but higher levels of these fungi are associated with crop debris of previous corn, sorghum, wheat, and rice crops that remains on the soil surface. Disease incidence and severity are highly associated with the number of rainy days before, during and after flowering. Symptoms first appear as individual blighted (dead and bleached-out) florets, but infection of the rachis (portion of the stem holding the seeds) can quickly blight the portion of the head above the infection or even the entire head. Close examination of blighted heads will reveal pink or orange mycelium at the base of the florets or on the dead seed inside the florets. Many of the shriveled seeds are blown out the back of combines, but a lot of tombstones (pink, chalky seeds) will be harvested with the healthy grain. The most serious aspect of this disease is that the Fusarium fungi produce several toxins that render the grain unsuitable for human and animal consumption. Deoxynivalenol (DON or vomitoxin) is the most common toxin in scabby wheat, and the threshold for whole grain wheat is 2 ppm. Several reliable methods of testing for DON are available to grain buyers, but representative sampling of large lots of grain remains a problem.

There are no silver bullets for keeping DON levels below 2 ppm when conditions are favorable for head blight. The risk of head blight can be reduced by not following corn, sorghum, rice, or wheat in rotations and by planting several varieties that flower at different times. Fungicides registered before 2007 are not very effective against head blight, but newer fungicides such as Prosaro, Caramba, and others are more effective against scab, however the need for uniform coverage of wheat heads lessen its potential in Arkansas where most fields are sprayed using aerial application.

Sooty molds

Sooty molds are saprophytic fungi that quickly cover heads with a layer of black, brown, or gray spores when prematurely dead heads or mature plants are exposed to moist conditions. Because they grow on dead tissue, sooty molds are not true diseases. Plants that die prematurely from take-all, barley yellow dwarf, Fusarium root and crown rot, and other causes are often covered with sooty molds while heads from healthy plants appear normal. When rainy weather delays harvest, all of the heads in a field may be affected, but sooty molds cause little damage to the grain unless the wet conditions persist for several days. No control methods are available.

Virus Diseases

Soilborne virus diseases

Two soilborne viruses, **soilborne wheat mosaic virus** and **wheat spindle streak mosaic virus**, affect wheat in parts of Arkansas. Both viruses are transmitted to wheat by a soilborne fungus. Once a field becomes infested with the fungus and viruses, it is likely to remain infested for a long time. Symptoms usually are seen shortly after green-up in the spring and may be confused with nitrogen deficiency. Diseased plants are chlorotic (yellow), poorly tillered, and stunted. Leaves from diseased plants have a mosaic pattern of yellow and green streaks. Plants affected only by **wheat spindle streak mosaic virus** are chlorotic but only slightly stunted, and leaves may have discrete spindle-shaped yellow streaks on a green background. These plants usually will green up when temperatures rise above 65º F, and yield will not be reduced significantly. Plants affected by **soilborne wheat mosaic virus** are severely stunted and more yellow than plants affected by wheat spindle streak mosaic. These plants are not likely to fully recover, and yield will be reduced significantly. Plants infected by both viruses have the symptoms of soilborne wheat mosaic. Diagnosing these diseases in the field can be difficult, and the only accurate method is to send plant samples to the Extension Plant Disease Clinic where testing for these particular viruses can be done.

The viruses and fungus can be moved to new fields by any method that moves soil (tillage equipment, flowing water, etc.), and limiting the spread to new fields is a good idea. Growing resistant varieties is the only method of managing these diseases once a field becomes infested. Obtaining an accurate identification of the virus(es) in particular fields is important because varieties may be resistant to either one or both viruses. Resistance to soilborne mosaic is more important than resistance to spindle streak mosaic because of the more severe effect on yield. No races or strains of these viruses are known to overcome the resistance currently used in varieties.

Barley yellow dwarf

Barley yellow dwarf virus is vectored by aphids, especially the bird-cherry oat aphid that is common in Arkansas. Wheat plants can be infected throughout the season, but symptoms are most severe when plants are infected shortly after emergence in the fall. Symptoms can be detected after green-up in the spring, but these symptoms are subtle and often either missed or attributed to poor fertility, root diseases, etc. These early symptoms are stunted, poorly tillered plants occurring in saucer-shaped patches, (circular patches with the most severely stunted plants in the center and a gradual increase in plant size toward the margin of the patch). By boot stage, symptoms will be more striking and can be seen from the road. The size difference between healthy and diseased plants is very obvious, and leaves of diseased plants are stiff, upright, and begin to yellow (or purple) from the tip toward the base with the most advanced portion of the color change along the margins of the leaf. Aphids may or may not be present when symptoms are noticed. Yield loss is proportional to the severity of stunting. Root systems are stunted more than the foliage, and diseased plants often die prematurely of drought stress if moisture is limiting during grain fill. Plants infected during the spring have the leaf symptoms described above but are not severely stunted and generally do not suffer severe yield loss. By heading stage, symptoms are usually plain enough to make an accurate diagnosis in the field, but samples can be sent to the Plant Disease Clinic for testing as well.

Management of barley yellow dwarf includes planting later in the season to avoid or limit fall infection. University of Arkansas Division of Agriculture Entomologists do not currently recommend seed treatments such as Gaucho or Cruiser for aphid control, due to the erratic nature of aphid migration into Arkansas during the fall.

Wheat streak mosaic

Wheat streak mosaic virus is transmitted by a mite that feeds on leaves and occurs rarely in Arkansas. The disease usually is associated with nearby volunteer wheat at planting time because the mite and virus survive best on wheat and to a lesser extent on other grasses. Symptoms include stunting, trapped and rolled leaves, and a yellow-green mosaic pattern on leaves. The trapped (leaf tip caught in the leaf sheath causing the leaf to be bent) and rolled leaves are caused by the mites, and the mites can be seen with the aid of a 10X hand lens. Symptoms become more severe as the season progresses. Positive diagnosis can be obtained only by sending plant samples to a plant disease diagnostic clinic that can test for this particular virus.

Destroying volunteer wheat plants a few weeks before planting the new wheat crop is the most effective and economical means of managing this disease.

Soilborne Diseases

Take-all

Take-all is the most important root disease of wheat in the Mid South and worldwide. Fields planted to wheat and double-cropped with soybean for several years have had some of the most severe take-all. Although wheat is the preferred host, the fungus causing take-all can attack a wide range of grasses and likely is native to the region. Between wheat crops, the fungus survives in infected roots and crowns of wheat and grassy weeds that were infected during previous years. After the new wheat crop emerges in the fall, the fungus grows through the soil to infect wheat roots, causing small black lesions. With mild temperatures and moist soil during fall and winter, the fungus spreads to roots of nearby plants and grows up the roots into the crown. After green-up in the spring, early symptoms are patches of stunted plants with yellow lower leaves that can be confused with other problems. To determine if take-all is the problem, dig up some of the stunted plants, wash soil from the roots, look for black lesions that completely circle the root, and then use a hand lens to examine the white portions of roots next to the black lesions. If a fine network of dark brown to black threads (fungal mycelium) can be seen on the roots, then take-all is the problem. Usually, symptoms are not noticed until grain fill when symptoms can be seen readily from the road. At this time, there are patches of dead, bleached-out plants that are in stark contrast to live plants that are still green. To determine if the plants were killed by take-all, pull up the plants by hand. They should pull up easily, and the crown and root stubs should be black. Strip back the leaf sheaths from the lower stems. If the base of the stems are shiny black, then there is no doubt that take-all is the problem. Research in Arkansas showed that only a small portion of the diseased plants die prematurely and that most survive long enough to produce some grain that is likely to be shriveled. Crowns and roots from these surviving plants are the most important source of inoculum for the next crop because they are not completely rotted like those from plants that were killed prematurely.

Based on research conducted in Arkansas, recommendations for managing take-all were developed for fields with and without irrigation. For fields with irrigation, crop rotation is the best option. One year out of wheat allows most of the take-all fungus to die before the next wheat crop is planted as long as grassy weeds are prevented from growing during the winter when wheat is not grown. Wheat following rice in rotation had less take-all than wheat following other summer crops. For fields without irrigation, continuous wheat with summer fallow was the best option. Soil in fallow fields gets much hotter than soil under a soybean crop, and the higher temperatures speed up decomposition of infested crowns and roots and weaken the take-all fungus. General recommendations that should be used in fields with and without irrigation include maintaining soil pH below 6.5 (high pH increases the disease), maintaining a well-balanced fertility program to promote optimum wheat growth, planting as late as practical in the fall to allow time for the fungus to die, and planting into a firm rather than a fluffy seed bed. There are no effective fungicides or resistant varieties. For further information see our Take-All Fact sheet at http://www.uaex.edu/Other_Areas/publications/HTML/FSA-7526.asp.

Root and crown rot

This is a common disease in dry areas of the western United States but only occurs in Arkansas when wheat plants become very drought-stressed during grain fill. Two different fungi (*Fusarium* and *Bipolaris*) cause root and crown rot and produce similar symptoms. The Fusarium fungus also causes head blight (scab). These fungi commonly infect a few roots of a few plants in most wheat fields, but no noticeable above-ground symptoms are produced unless the plants become drought stressed. When plants are stressed, the fungi are able to grow up the root into the crown. Once the crown is infected, all of the stems of the plant die suddenly, and dead plants appear bleached-out in contrast to green healthy plants. Usually the dead plants occur individually or in small patches. Dead plants are difficult to pull up (in contrast to take-all where plants pull up easily) because the root system is not rotted. The inside of diseased crowns is pink if infected by *Fusarium* and brown if infected by *Bipolaris* (compared to white healthy crowns and black for crowns killed by take-all). Plants killed by *Bipolaris* also will have a dark brown to black sub-crown internode (stem-like connection between the wheat seed and the crown above the seed).

The only practical means of managing root and crown rot is to irrigate to prevent severe drought stress during grain fill; however this is impractical for most farms and not usually needed in Arkansas. Fungicide seed treatments, low seeding rates, and low nitrogen rates are used to manage root and crown rot in dry areas where the disease is common, but these practices are not warranted here where the disease is infrequent.

Pythium root rot

This disease likely infects every wheat plant in the field at some time during the season, but most infections go unnoticed because wheat plants produce new roots to replace the infected ones and because there are no completely disease-free plants for comparison. However, young seedlings can be stunted or even killed if conditions remain more favorable for Pythium than for wheat plants producing new roots. This disease is difficult to diagnose unless the symptoms are severe. Severe symptoms include missing, stunted, or poorly-tillered plants (poor stand). Roots of these plants will be brown with few root hairs. However, small diseased roots are difficult to recover from soil because they break easily.

The most practical means of managing Pythium root rot is to plant seed with high vigor and to provide optimum conditions for stand establishment. Avoid wet, compacted soils that favor Pythium root rot more than wheat growth. Provide adequate, balanced fertility to promote vigorous seedling establishment. There are no resistant varieties, and seed treatment fungicides that are effective against some Pythium species have not resulted in higher yields in Arkansas.

Table 1. Summary of Arkansas 2010-2011 Wheat Yields (Bu/ac) in Standard Input Trials.						
	---------------------------------Standard Input -----------------------------					
Variety/Brand Name	**Keiser**	**Kibler**	**Marianna**	**Newport**	**Rohwer**	**Delta Avg.**
AGS 2026	55.2	23.5	88.0	58.7	82.5	71.1
AGS 2035	73.8	50.2	84.9	76.0	99.5	83.5
AGS 2052	70.3	50.3	83.1	81.1	100.9	83.8
AGS 2056	77.1	42.7	90.6	72.2	105.1	86.2
AGS 2060	67.7	44.5	72.4	70.6	96.1	76.7
Armor Renegade	70.5	51.1	86.0	73.8	102.0	83.1
Armor Ricochet	74.5	50.5	91.5	70.6	110.7	86.8
ARX 0179	61.7	35.5	83.5	70.2	95.2	77.7
ARX 0186	78.7	34.0	86.9	66.0	92.4	81.0
ARX 1234	62.2	45.3	84.7	52.9	97.7	74.4
ARX 1235	79.3	63.6	76.5	64.5	103.4	80.9
CL7	69.7	23.0	78.6	67.4	94.5	77.6
Croplan 554W	65.0	31.8	88.9	71.4	95.6	80.2
Croplan 8302	71.3	46.1	82.7	72.1	97.0	80.8
Croplan 8868	67.6	42.8	78.7	62.7	102.5	77.9
Delta Grow 1600	69.7	33.4	75.9	59.7	94.1	74.9
Delta Grow 7500	74.7	56.3	90.1	79.3	103.0	86.8
Delta Grow 7900	57.6	47.7	86.4	72.9	97.8	78.7
Delta Grow 8300	58.3	38.8	81.1	66.4	94.4	75.0
Dixie 454	74.7	39.9	83.8	78.9	82.1	79.9
Dixie Bell DB2125	66.8	29.6	75.6	64.1	69.3	68.9
Dixie Bell DB2150	60.4	28.2	66.5	61.5	73.1	65.4
Dixie Bell DB620	72.9	41.2	90.7	64.6	94.4	80.6
Dixie Bell DB7100	64.0	39.3	63.6	72.6	92.0	73.0
Dixie Bell DB7440	64.6	27.7	74.8	73.7	79.6	73.1
Dixie Brown	65.1	36.3	82.5	71.6	93.3	78.1
Dixie Kelsey	76.7	54.0	91.0	77.8	101.0	86.6
Dixie McAlister	82.2	66.9	94.2	63.9	106.7	86.7
DK 9577	57.5	43.2	74.5	61.4	94.4	72.0
Dyna-Gro 9012	73.8	59.6	89.5	83.8	95.7	85.7
Dyna-Gro 9053	73.3	44.2	81.4	79.8	101.1	83.9
Dyna-Gro 9171	78.9	53.5	97.9	69.3	106.3	88.1
Dyna-Gro Baldwin	63.9	49.0	78.7	61.8	103.0	76.9
EXCEL 163	64.3	30.5	83.2	65.1	85.8	74.6
EXCEL 180	62.0	38.2	73.9	54.9	81.7	68.1
EXCEL 234	57.0	56.0	61.9	72.3	90.5	70.4
EXCEL 341	60.8	25.4	70.9	55.3	74.5	65.4
EXCEL 442	68.7	58.5	73.2	67.8	97.1	76.7
GA 00067-8E25	72.4	55.0	81.2	71.7	91.1	79.1
GA 001138-8E36	69.8	50.9	74.8	65.7	98.5	77.2
HBK 3266	60.9	43.1	76.9	65.5	93.8	74.3
Jamestown	73.7	53.0	83.4	70.0	98.7	81.4
LA 01069D-23-4-4	67.1	57.4	79.3	69.2	98.4	78.5
LA 01110D-150	71.9	40.7	82.4	74.9	88.2	79.3
LA 02006E239	60.6	41.7	72.8	73.8	94.1	75.3

Table 1. Summary of Arkansas 2010-2011 Wheat Yields (Bu/ac) in Standard Input Trials.						
	--------------------------------Standard Input ----------------------------					
Variety/Brand Name	**Keiser**	**Kibler**	**Marianna**	**Newport**	**Rohwer**	**Delta Avg.**
Merl	68.2	35.4	84.4	61.3	95.8	77.4
Pioneer Variety 25R32	67.2	33.9	83.4	54.8	89.5	73.7
Pioneer Variety 26R15	72.8	56.1	83.6	74.8	92.8	81.0
Pioneer Variety 26R20	71.4	46.1	94.2	67.8	94.4	81.9
Pioneer Variety 26R22	69.6	50.6	87.9	58.5	103.5	79.9
Pioneer Variety 26R87	81.1	51.3	82.8	72.4	95.9	83.1
Pioneer Variety XW09H	74.4	50.9	92.4	86.2	99.9	88.2
Progeny 117	65.3	31.9	72.6	71.6	87.2	74.2
Progeny 125	62.2	23.9	87.1	57.3	93.2	74.9
Progeny 166	70.4	31.1	77.6	74.3	73.7	74.0
Progeny 185	68.5	32.0	86.0	57.7	94.1	76.6
Progeny PGX10-2	60.9	44.5	62.7	44.8	98.9	66.8
Progeny 870	83.2	46.9	91.3	83.6	108.1	91.5
Progeny 357	70.1	44.8	84.3	76.7	95.6	81.7
Roane	57.4	43.3	76.4	72.6	87.3	73.4
Syngenta Arcadia	65.4	41.1	80.9	66.0	84.3	74.1
Syngenta Beretta	59.7	39.3	86.0	70.6	98.3	78.6
Syngenta Coker 9553	60.6	42.4	74.5	73.7	99.3	77.0
Syngenta Magnolia	63.1	53.6	72.4	71.5	89.7	74.2
Syngenta Oakes	65.3	39.2	74.1	60.7	89.4	72.4
Syngenta SY 9978	58.2	52.8	76.7	67.9	97.9	75.2
Terral LA821	59.2	45.1	82.2	64.0	81.3	71.7
Terral LA841	59.1	39.5	79.0	49.6	93.0	70.2
Terral TV8558	62.5	41.0	75.3	60.5	95.2	73.4
Terral TV8589	58.7	41.1	86.4	65.0	95.7	76.4
Terral TV8861	79.7	52.7	88.9	73.0	102.9	86.1
Terral TVX8460	64.6	26.7	70.6	52.5	73.5	65.3
Terral TVX8525	71.6	46.9	89.6	76.9	103.3	85.3
Terral TVX8535	73.8	49.3	93.5	76.5	98.1	85.5
Terral TVX8626	71.2	49.8	84.3	72.8	99.2	81.9
Terral TVX8848	82.8	53.7	91.3	63.2	92.0	82.3
USG 3120	59.2	40.1	90.3	66.2	99.5	78.8
USG 3201	75.1	52.7	92.8	76.8	103.5	87.1
USG 3251	74.3	51.8	86.3	67.9	98.7	81.8
USG 3295	63.7	42.5	79.7	67.4	100.2	77.7
USG 3438	82.8	57.8	91.6	83.7	102.5	90.2
USG 3555	73.5	39.3	86.9	72.8	99.0	83.0
Trial Average	**68.2**	**43.8**	**82.0**	**68.5**	**94.6**	**78.3**
LSD (5%)	18.5	22.2	16.4	24.0	19.2	

*****Trials at Stuttgart sustained severe glyphosate drift and yields were not reported.**

Table 2. Two-Year Average Wheat Yields (Bu/ac) in Standard and High Input Trials.							
Variety/Brand Name	----------------------------Standard Input ------------------------						High Input
	Keiser	Kibler	Marianna	Newport	Rohwer	Stuttgart	Stuttgart
AGS 2026	63.9	22.8	66.9	69.6	77.4	59.8	63.9
AGS 2035	77.6	47.3	66.5	71.5	81.7	45.1	56.5
AGS 2060	70.2	46.9	57.5	68.9	80.4	46.8	48.7
Armor Renegade	73.2	46.4	66.6	67.1	76.8	58.7	55.3
Armor Ricochet	79.6	---	69.2	66.0	---	---	---
Croplan 554W	71.3	32.2	68.5	65.9	73.5	53.2	61.6
Croplan 8302	76.9	47.0	70.8	74.8	75.7	53.3	59.6
Croplan 8868	--	37.1	--	--	81.7	---	---
Delta Grow 1600	63.7	36.8	62.1	61.4	76.2	55.4	52.0
Delta Grow 8300	73.6	---	60.7	67.8	---	---	---
Delta King 9577	67.0	38.5	58.6	61.4	75.1	58.4	56.9
Dixie 454	73.1	45.6	68.0	69.2	71.5	51.8	52.1
Dixie Bell DB2125	65.9	36.9	67.1	67.3	62.7	61.6	59.2
Dixie Bell DB2150	62.1	31.3	58.6	62.5	66.1	54.9	56.0
Dixie Bell DB7440	61.4	27.3	62.6	71.1	70.5	56.9	56.9
Dyna-Gro 9012	75.6	---	74.5	75.0	---	---	---
Dyna-Gro Baldwin	69.0	43.8	59.6	61.5	78.2	52.9	49.8
HBK 3266	66.2	41.7	58.9	63.7	74.9	51.8	55.7
Jamestown	76.1	48.6	66.2	67.6	80.1	57.6	58.8
LA 01110D-150	73.9	---	70.9	73.7	---	---	---
Merl	73.4	36.9	70.2	71.5	74.2	52.3	61.2
Pioneer Variety 25R32	68.3	---	68.2	62.8	---	---	---
Pioneer Variety 26R15	76.7	52.8	67.6	71.9	71.8	53.0	58.7
Pioneer Variety 26R20	76.8	---	71.9	73.8	---	---	---
Pioneer Variety 26R22	70.7	47.2	65.2	60.6	80.7	51.8	56.3
Pioneer Variety 26R87	74.0	49.5	64.4	68.0	77.1	55.1	59.6
Progeny 117	69.8	35.2	53.8	69.5	72.7	48.0	50.6
Progeny 125	68.3	---	69.8	64.3	---	---	---
Progeny 166	69.9	35.6	65.8	71.0	70.9	56.6	51.3
Progeny 185	66.0	40.0	69.1	62.0	82.2	59.3	60.6
Roane	67.1	40.4	59.8	67.7	63.9	51.3	53.5
Syngenta Arcadia	66.5	---	62.9	69.2	---	---	---
Syngenta Beretta	67.8	42.6	65.4	69.1	74.3	58.4	55.5
Syngenta Coker 9553	60.9	44.3	64.2	71.8	78.6	53.0	53.7
Syngenta Magnolia	61.1	54.8	57.8	68.4	75.6	55.3	52.9
Syngenta Oakes	67.6	41.0	72.8	62.2	74.0	53.3	55.7
Syngenta SY 9978	61.3	---	59.5	69.8	---	---	---
Terral LA821	65.9	---	60.9	60.4	---	---	---
Terral LA841	61.1	40.7	62.6	65.1	75.8	57.4	55.0
Terral TV8558	68.0	41.3	60.6	62.1	74.2	53.9	54.9
Terral TV8589	65.6	41.1	65.8	69.3	79.2	54.8	63.8
Terral TV8861	75.3	---	71.2	71.4	---	---	---
USG 3120	70.3	---	66.3	71.1	---	---	---

Table 2. Two-Year Average Wheat Yields (Bu/ac) in Standard and High Input Trials.							
Variety/Brand Name	**-----------------------------Standard Input ------------------------**						**High Input**
	Keiser	**Kibler**	**Marianna**	**Newport**	**Rohwer**	**Stuttgart**	**Stuttgart**
USG 3201	79.3	---	64.8	69.7	---	---	---
USG 3295	69.1	45.5	55.4	67.4	80.7	44.5	50.8
USG 3438	79.4	---	70.1	75.3	---	---	---
USG 3555	76.2	47.2	70.7	71.0	79.0	55.7	60.0
Trial Average	**69.9**	**41.4**	**65.0**	**67.9**	**75.4**	**54.1**	**56.1**

Table 3. Three-Year Average Wheat Yields (Bu/ac) in Standard and High Input Trials.							
Variety/Brand Name	**----------------------------Standard Input -----------------------**						**High Input**
	Keiser	**Kibler**	**Marianna**	**Newport**	**Rohwer**	**Stuttgart**	**Stuttgart**
AGS 2026	61.8	33.2	74.3	56.3	84.5	65.5	69.7
AGS 2035	72.8	---	68.8	62.7	---	---	---
AGS 2060	67.6	55.5	68.2	60.0	90.0	59.4	64.0
Armor Renegade	69.3	---	73.9	58.8	---	---	---
Croplan 554W	70.4	43.2	71.4	59.2	79.4	61.9	71.5
Croplan 8302	70.0	54.9	74.9	63.9	85.5	63.1	73.3
Delta Grow 1600	63.5	48.3	69.7	53.6	84.5	64.0	65.8
Dixie 454	66.8	51.3	73.5	61.3	80.9	63.4	64.3
Dixie Bell DB2125	66.0	40.8	71.1	57.6	73.5	70.0	71.7
Dixie Bell DB2150	61.1	34.8	67.3	53.7	76.3	64.8	70.1
Dixie Bell DB7440	62.0	30.6	67.0	60.9	79.2	67.8	69.9
DK 9577	63.0	40.5	66.9	56.3	82.3	65.4	69.1
Dyna-Gro Baldwin	67.0	---	68.3	53.2	---	---	---
HBK 3266	64.0	50.5	67.5	55.6	84.3	59.3	63.8
Jamestown	72.9	55.6	71.3	59.4	85.2	64.5	67.9
LA 01110D-150	69.8	---	76.8	65.6	---	---	---
Merl	68.4	---	72.5	58.3	---	---	---
Pioneer Variety 26R15	68.7	60.6	73.7	62.8	81.6	63.3	69.2
Pioneer Variety 26R20	71.1	---	75.4	63.2	---	---	---
Pioneer Variety 26R22	68.3	55.8	69.6	55.5	86.2	59.0	68.5
Pioneer Variety 26R87	71.1	53.2	68.7	59.3	83.9	61.5	65.3
Progeny 117	66.8	41.1	60.7	59.0	81.9	58.6	66.8
Progeny 166	68.1	41.3	71.0	60.3	78.1	66.1	66.4
Progeny 185	64.8	49.9	76.3	53.3	87.7	69.6	74.1
Roane	68.2	52.6	69.0	55.7	71.8	56.3	63.4
Syngenta Beretta	65.9	54.7	72.9	59.6	81.8	66.8	67.7
Syngenta Coker 9553	60.9	48.8	70.4	58.7	82.6	62.3	64.1
Syngenta Magnolia	61.2	61.0	64.0	57.2	83.1	65.4	68.5
Syngenta Oakes	66.0	---	75.6	55.2	---	---	---
Terral LA841	62.6	49.1	66.8	54.8	81.9	63.8	64.5
Terral TV8558	64.3	48.5	68.8	52.8	77.9	62.9	67.6
Terral TV8589	64.7	52.0	73.9	60.0	87.5	65.0	72.2
USG 3295	67.3	43.3	62.8	60.1	87.2	56.3	63.7
USG 3555	72.4	55.5	73.6	62.4	83.7	64.2	71.5
Trial Average	**66.7**	**48.4**	**70.5**	**58.4**	**82.3**	**63.3**	**67.9**

Table 4. Disease Reactions of Selected Wheat Varieties and Lines Evaluated in Arkansas 2010-2011.

Variety/Brand Name	Stagonospora Blotch	Leaf Rust	FHB Scab	Stripe Rust	Stem Rust	Powdery Mildew	Spindle Streak	Soilborne Mosaic	Leaf Blotch
AGS 2026	MS	R		R					
AGS 2035	S	R							
AGS 2052	MS	R							
AGS 2056	MS	R							
AGS 2060	MS	R	S	MS	R	MS			MR
Armor Renegade	S	S	S	VS	MR	MR			MS
Armor Ricochet	S	R	MS	R	MS	S			
ARX 0179	MS	MS							
ARX 0186	MR	R							
ARX 1234	S	R							
ARX 1235	MR	R							
CL7	VS	MR							
Croplan 554W	MS	MS		S			R	R	MS
Croplan 8302	MR	R	S	R	MR	S	R	R	MS
Croplan 8868	S	R	MS	R	S	MS			
Delta Grow 1600	MS	MR	MS	R	S	MS	R	R	MR
Delta Grow 7500	MR	R							
Delta Grow 7900	MS	MR							
Delta Grow 8300	S	R	VS	MR	MR	MS			
Delta King 9577	MR	R			S		S	R	S
Dixie 454	S	R	MS	MS	S	MS			MR
Dixie Bell DB2125	S	S							
Dixie Bell DB2150	MS	S							
Dixie Bell DB620	MS	MR							
Dixie Bell DB7100	MR	R							
Dixie Bell DB7440	MS	S							
Dixie Brown	S	R							
Dixie Kelsey	S	MR							
Dixie McAlister	MS	R							
Dyna-Gro 9171	MR	R							
Dyna-Gro Baldwin	MS	R							
EXCEL 163	S	MS							
EXCEL 180	S	S							
EXCEL 234	MS	R							
EXCEL 341	S	MS							
EXCEL 442	MR	MR							
GA 00067-8E25	S	R							
GA 001138-8E36	MS	R							
HBK 3266	MS	R		S			S	MS	MS
Jamestown	MR	R	MR	R	R	MR			
LA 01069D-23-4-4	S	MR							
LA 01110D-150	MS	R							
LA 02006E239	MR	R							
Merl	VS	MS							
Pioneer Variety 25R32	MR	S							

Table 4. Disease Reactions of Selected Wheat Varieties and Lines Evaluated in Arkansas 2010-2011.									
	Stagonospora	**Leaf**	**FHB**	**Stripe**	**Stem**	**Powdery**	**Spindle**	**Soilborne**	**Leaf**
Variety/Brand Name	**Blotch**	**Rust**	**Scab**	**Rust**	**Rust**	**Mildew**	**Streak**	**Mosaic**	**Blotch**
Pioneer Variety 26R15	MS	R					R	R	MS
Pioneer Variety 26R20	MR	R	VS	MR	MS	MR			
Pioneer Variety 26R22	S	R	S	R	S	MS	R	R	MS
Pioneer Variety 26R87	MS	R					MR	R	MS
Pioneer Variety XW09H	S	R							
Progeny 117	S	S							
Progeny 125	S	S							
Progeny 166	S	S	MR	R	MR	S	MS	R	MS
Progeny 185	MS	MS	MS	S	R	MS			MR
Progeny PGX10-2	S	R							
Progeny 870	MS	R							
Progeny 357	S	R							
Roane	S	R		S			S	R	S
Syngenta Arcadia	S	R	S	R	R	S			
Syngenta Beretta	S	MR	MS	R	S	MS	MR	R	MS
Syngenta Coker 9553	MS	R	S	R	S	MS	S	R	MS
Syngenta Magnolia	MR	MR							
Syngenta Oakes	MR	MS	MR	R	R	S			MR
Syngenta SY 9978	S	R							
Terral LA821	MS	R							
Terral LA841	VS	R	VS	R	R	MS	VS	VS	S
Terral TV8558	S	R							
Terral TV8589	S	MR	MS	MR	S	MS			
Terral TV8861	MS	R							
Terral TVX8460	S	S							
Terral TVX8535	MS	R							
Terral TVX8848	MS	R							
USG 3120	VS	R							
USG 3201	VS	MR							
USG 3251	VS	R							
USG 3295	S	R							
USG 3438	S	R							
USG 3555	S	R	MS	R	R	MR			MR

R = Resistant; MR = Moderately Resistant; MS = Moderately Susceptible; S = Susceptible; VS = Very Susceptible.

Table 5. Agronomic Characteristics of Varieties in 2010-2011 – average of all locations.

Variety/Brand Name	Test Wt. Lb/bu	Lodging %	Height Inches	Heading Date	Relative Maturity	Head Type
AGS 2026	59.6	6	28	April 11	ME	Awnless
AGS 2035	60.4	3	31	April 11	ME	Awned
AGS 2052	57.6	1	32	April 14	ML	Awned
AGS 2056	57.4	3	32	April 11	ME	Awned
AGS 2060	60.5	9	34	April 12	M	Awned
Armor Renegade	59.3	3	34	April 12	M	Awned
Armor Ricochet	58.3	1	32	April 12	M	Awned
ARX 0179	61.0	4	31	April 12	M	Awnless
ARX 0186	58.7	4	32	April 12	M	Awned
ARX 1234	56.3	2	32	April 14	ML	Awned
ARX 1235	57.1	3	33	April 15	L	Awned
CL7	59.5	7	32	April 11	ME	Awned
Croplan 554W	58.1	7	32	April 13	M	Awnless
Croplan 8302	58.6	5	34	April 14	ML	Awned
Croplan 8868	59.1	3	33	April 13	M	Awnless
Delta Grow 1600	58.0	3	34	April 13	M	Awnless
Delta Grow 7500	58.9	1	32	April 12	M	Awned
Delta Grow 7900	60.2	3	32	April 12	M	Awnless
Delta Grow 8300	56.3	3	32	April 12	M	Awned
Delta King 9577	58.5	6	33	April 14	ML	Awnless
Dixie 454	60.6	2	33	April 12	M	Awnless
Dixie Bell DB2125	58.0	8	35	April 11	ME	Awnless
Dixie Bell DB2150	57.6	6	34	April 11	ME	Awnless
Dixie Bell DB620	56.4	9	33	April 13	M	Awned
Dixie Bell DB7100	58.6	8	33	April 14	ML	Awnless
Dixie Bell DB7440	59.7	8	34	April 11	ME	Awnless
Dixie Brown	58.1	6	33	April 14	ML	Awnless
Dixie Kelsey	61.8	0	32	April 12	M	Awned
Dixie McAlister	56.9	3	33	April 12	M	Awned
Dyna-Gro 9012	61.2	4	31	April 12	M	Awned
Dyna-Gro 9053	57.2	3	32	April 15	L	Awned
Dyna-Gro 9171	58.2	1	33	April 12	M	Awned
Dyna-Gro Baldwin	60.4	1	36	April 14	ML	Awned
EXCEL 163	61.5	8	31	April 11	ME	Awned
EXCEL 180	59.5	6	33	April 11	ME	Awnless
EXCEL 234	58.2	7	33	April 14	ML	Awnless
EXCEL 341	57.0	4	34	April 13	M	Awnless
EXCEL 442	58.6	6	35	April 15	L	Awned
GA 00067-8E25	58.7	8	33	April 12	M	Awned
GA 001138-8E36	58.3	6	35	April 14	ML	Awned
HBK 3266	59.4	8	33	April 12	M	Awned
Jamestown	61.5	13	32	April 11	ME	Awned
LA 01069D-23-4-4	60.6	6	34	April 12	M	Awned
LA 01110D-150	60.1	7	33	April 12	M	Awned
LA 02006E239	59.7	6	33	April 13	M	Awned

Table 5. Agronomic Characteristics of Varieties in 2010-2011 – average of all locations.						
	Test Wt.	**Lodging**	**Height**	**Heading**	**Relative**	**Head**
Variety/Brand Name	**Lb/bu**	**%**	**Inches**	**Date**	**Maturity**	**Type**
Merl	60.1	6	33	April 11	ME	Awnless
Pioneer Variety 25R32	58.9	3	32	April 14	ML	Awned
Pioneer Variety 26R15	58.9	9	34	April 13	M	Awned
Pioneer Variety 26R20	59.8	5	34	April 12	M	Awned
Pioneer Variety 26R22	58.7	10	33	April 12	M	Awned
Pioneer Variety 26R87	60.8	3	33	April 12	M	Awned
Pioneer Variety XW09H	58.9	1	32	April 14	ML	Awned
Progeny 117	60.3	14	33	April 11	ME	Awnless
Progeny 125	59.1	6	33	April 11	ME	Awnless
Progeny 166	59.3	10	37	April 12	M	Awnless
Progeny 185	57.8	4	33	April 12	M	Awnless
Progeny PGX10-2	55.0	7	33	April 14	ML	Awnless
Progeny 870	58.4	2	33	April 12	M	Awned
Progeny 357	56.9	3	34	April 14	ML	Awned
Roane	60.6	2	32	April 14	ML	Awnless
Syngenta Arcadia	61.0	10	33	April 9	E	Awned
Syngenta Beretta	56.6	12	33	April 15	L	Awnless
Syngenta Coker 9553	61.8	5	33	April 12	M	Awned
Syngenta Magnolia	58.8	2	34	April 14	ML	Awned
Syngenta Oakes	58.3	5	33	April 12	M	Awnless
Syngenta SY 9978	58.4	10	33	April 12	M	Awned
Terral LA821	59.0	7	33	April 11	ME	Awned
Terral LA841	57.3	4	33	April 12	M	Awned
Terral TV8558	58.2	3	33	April 13	M	Awnless
Terral TV8589	56.4	14	35	April 13	M	Awnless
Terral TV8861	58.3	2	34	April 14	ML	Awned
Terral TVX8460	56.8	13	35	April 13	M	Awnless
Terral TVX8525	59.7	8	32	April 12	M	Awned
Terral TVX8535	57.4	3	32	April 12	M	Awned
Terral TVX8626	57.0	5	34	April 15	L	Awned
Terral TVX8848	57.5	2	34	April 14	ML	Awned
USG 3120	60.0	3	34	April 10	E	Awned
USG 3201	60.4	10	32	April 12	M	Awned
USG 3251	58.6	3	32	April 14	ML	Awned
USG 3295	58.8	3	34	April 11	ME	Awnless
USG 3438	59.0	1	34	April 12	M	Awned
USG 3555	58.2	1	31	April 13	M	Awnless
Trial Average	**58.5**	**5**	**33**	April 12		