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Wheat Update 2016

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ARKANSAS WHEAT PERFORMANCE TRIALS AND VARIETY SELECTION

Wheat performance trials were conducted during the 2015-2016 growing season by the Arkansas Wheat Variety Testing Program under the direction of Dr. Esten Mason to provide information about yield potential, agronomic characteristics, and disease reaction of commercially available varieties of wheat. Variety selection is very important for successful and profitable wheat production. This publication is a summary of the Arkansas Wheat Variety Testing Program results of commercially available varieties and is designed to help producers select adapted, high-yielding, and disease-resistant wheat varieties.

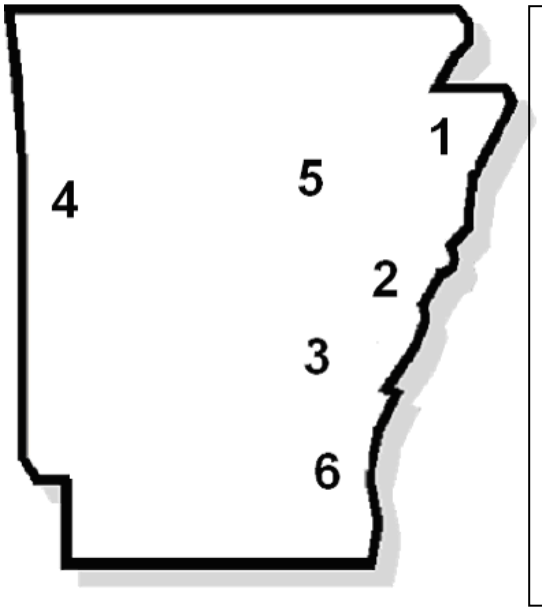

FIGURE 1. LOCATIONS OF ARKANSAS WHEAT PERFORMANCE TRIALS

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 – Newport Station – Beulah Fine Sandy Loam

6 – Southeast Branch Station, Rohwer – Herbert Silt Loam

Methods of Variety Trials

Wheat varieties and experimental lines were entered by seed companies and public institutions and evaluated for an unbiased comparison of their performance. In general, recommended cultural practices for wheat production in Arkansas were used. All locations were planted between October 20th and November 21st into conventionally tilled seedbeds using small plot planters.

Each trial consisted of 96 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, with the exception Rohwer which was 82 lb/A. Recommended production practices were followed and pests were controlled as needed. Plots were harvested timely 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 2015-16*, Arkansas Agricultural Experiment Station, located at www.arkansasvarietytesting.com.

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Variety Selection

Variety selection is an important management decision in wheat production. There are many factors that producers should consider when evaluating potential wheat varieties in addition to yield potential. Genetic diversity is very important as no single variety will be the best performer every year. Planting more than one variety with differing maturity is the best way to spread risks. Always look at two and three-year average yields rather than yield from any particular season (See Tables 2 and 3) to get a better understanding of variety performance.

Wheat yields of commercially available varieties from the 2015-2016 growing season are reported in Table 1. Yields in some trials were reduced by wet weather from February through May. Stripe rust was heavy on susceptible varieties leading to large differences in yield between stripe rust resistant and susceptible varieties. The Newport location had a fungicide applied for stripe rust control, but stripe rust was still a problem on susceptible varieties. All other locations did not receive a foliar fungicide. Fusarium head blight (scab) was much lighter this year than in 2015. Fusarium head blight ratings from misted and inoculated nurseries at Newport and Fayetteville can be found in Table 4. Leaf rust appeared late in the season at heavy levels on susceptible varieties

Two and three year average yields of commercially available varieties are reported in Tables 2 and 3. Multiple years of yield data provides a better indicator of how a variety will perform compared to just one year. Not all locations have data available on all varieties. Agronomic data such as test weight, plant height, lodging, heading date, maturity date, and relative maturity for commercially available varieties tested in 2015-2016 are found in Table 5.

Disease Resistance

Stripe rust resistance is very important for Mid-South wheat producers to consider. Foliar fungicides can help control stripe rust, but can add additional production expense that could be avoided with a variety that is resistant to stripe rust. Varieties that are rated susceptible or very susceptible may need more than one fungicide application to control stripe rust if conditions are conducive for disease development. Keep in mind, stripe rust ratings are taken after heading. Many varieties can have stripe rust develop prior to heading (February-March) even though they may be resistant varieties. Resistance genes become more active after jointing. Leaf rust and fusarium head blight resistance should also be considered when choosing wheat varieties. A summary of foliar disease ratings taken in the spring of 2016 are found in Table 4.

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 as much of a vernilization requirement as later maturing varieties and can begin jointing very early in the spring, which increases the likelihood of freeze injury from a late spring freeze. Late maturity 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. Planting varieties with differing maturity may help spread out harvest operations so that wheat can be harvested when ready. An estimated relative maturity rating based on heading date can be found in Table 5.

Test Weight

Many producers have experienced low test weight wheat during the last few years as a result of excessive rainfall and or delayed harvest. Harvesting wheat timely is important for high test weight wheat. Foliar diseases can also be a factor in overall test weight, but some varieties have characteristically higher test weights than others. When environmental conditions cause poor test weights, varieties with high test weight potential usually have heavier test weights than other varieties. Selecting a variety with a good test weight along with good foliar disease resistance can reduce the likelihood of having low test weight wheat that may be discounted at the grain terminal. Differences in test weight of 3 to 4 lbs/bu between varieties is common.

Lodging Resistance

Lodging resistance is important to prevent yield losses and to allow for efficient harvest. Variety, nitrogen rate, and seeding rate all have an impact on lodging. Varieties with low lodging scores and high yields are preferred. Lodging ratings taken in 2016 are shown in Table 5, however very little lodging of any varieties were noted.

Insect Resistance

Hessian fly can be a problem in Arkansas wheat. There are several biotypes of Hessian fly, but the predominant biotype in Arkansas is Biotype ‘L’. Delayed planting is a recommended practice for avoiding Hessian fly problems.

Table 1. Arkansas Wheat Performance Trials Summary at Four Locations in 2015-2016.						
	Kibler	Marianna	Newport	Rohwer	Delta Avg*	State Avg Rank
Variety/Brand Name	----------Standard Input Yield (bu/a) ----------					
AG 2650	57.9	79.7	47.4	73.1	66.7	33
AgriMAXX 413	63.0	80.7	77.5	73.7	77.3	5
AgriMAXX 415	60.1	78.3	56.4	72.9	69.2	22
AgriMAXX 444	54.6	80.1	53.3	69.7	67.7	35
AgriMAXX 446	57.5	75.7	65.0	69.7	70.1	23
AGS 2024	66.6	71.9	58.6	78.7	69.7	16
AGS 2038	54.5	83.7	67.4	79.9	77.0	7
AGS 2055	75.0	87.0	69.2	85.8	80.6	1
AGS 3000	58.7	71.1	41.6	46.1	52.9	44
Delta Grow 1000	63.3	83.8	74.1	87.5	81.8	3
Delta Grow 2700	59.1	70.6	55.6	75.1	67.1	30
Delta Grow 3500	59.1	79.0	55.2	86.7	73.6	10
Delta Grow 7500	52.7	82.3	53.7	75.3	70.4	28
Dixie Bell 125	24.1	33.1	20.3	44.1	32.5	48
Dixie Bell 500	67.0	74.4	58.6	66.7	66.6	25
Dixie Bell 600	70.2	68.4	68.4	76.9	71.2	9
Dixie Bell 620	62.3	73.2	64.7	67.9	68.6	23
Dixie Bell 7414	33.8	62.9	49.2	66.0	59.4	45
Dixie Xtreme	61.5	64.7	49.0	52.5	55.4	41
Dixie McAlister	62.6	79.2	60.3	76.3	71.9	13
Dyna-Gro 9012	57.1	82.2	60.8	79.9	74.3	12
Dyna-Gro 9171	65.2	84.2	58.9	80.9	74.7	6
Dyna-Gro 9522	63.7	72.2	48.4	73.5	64.7	34
Dyna-Gro 9552	63.4	72.0	49.3	69.5	63.6	37
Dyna-Gro 9642	61.4	72.9	68.5	74.6	72.0	15
Go Wheat 2056	53.9	76.4	52.6	73.0	67.3	36
Go Wheat 2058	50.8	81.6	63.3	82.4	75.8	14
Go Wheat 2059	67.8	81.2	47.7	75.2	68.0	20
LCS 4343	27.3	62.2	49.5	60.6	57.4	46
Pioneer 26R10	59.8	67.5	63.2	62.3	64.4	38
Pioneer 26R41	68.8	85.0	72.1	84.7	80.6	2
Pioneer 26R53	66.6	76.6	64.2	67.4	69.4	19
Pioneer 26R59	69.2	80.6	60.9	72.7	71.4	8
Pioneer 26R87	63.3	73.7	53.8	75.5	67.7	25
Progeny 243	42.9	68.8	48.9	63.3	60.3	42
Progeny 357	54.1	56.1	52.8	57.4	55.4	43
Progeny 410	14.5	45.1	33.2	39.9	39.4	47
Progeny 870	63.0	78.6	63.2	71.5	71.1	18
Syngenta Oakes	59.2	74.0	58.4	76.6	69.6	21
Syngenta SY Harrison	64.5	76.3	53.5	68.5	66.1	29
Syngenta SY Viper	64.3	80.1	48.3	73.0	67.1	25
USG 3013	58.0	65.2	47.9	60.6	57.9	40
USG 3201	63.4	84.2	58.0	74.3	72.1	11
USG 3404	59.3	70.7	52.2	76.8	66.6	31
USG 3438	63.3	76.9	58.4	77.5	70.9	16

Table 1. Continued. Arkansas Wheat Performance Trials Summary at Four Locations in 2015-2016.						
	Kibler	**Marianna**	**Newport**	**Rohwer**	**Delta Avg***	**State Avg Rank**
Variety/Brand Name	**----------Standard Input Yield (bu/a) ----------**					
USG 3523	59.3	63.9	49.0	64.9	59.3	39
VA Hilliard	62.8	88.2	58.2	89.2	78.5	4
Mean	58.1	74.0	56.2	71.3	67.1	32
LSD (0.05)	**10.4**	**7.7**	**14.1**	**10.1**	**---**	**---**
*Delta average is calculated from Marianna, Newport, and Rohwer locations						

Table 2. Two-Year Average Yields (Bu/a) in Arkansas Wheat Performance Trials at Six Locations (2014-16).							
Variety/Brand Name	**Keiser***	**Kibler**	**Marianna**	**Newport***	**Rohwer**	**Stuttgart***	**Delta Avg.****
AgriMAXX 413	60.8	54.0	86.1	79.6	85.4	70.7	85.8
AgriMAXX 415	68.5	51.0	83.5	68.5	81.1	68.6	82.3
AgriMAXX 444	64.8	44.3	84.7	---	79.5	71.1	82.1
AgriMAXX 446	59.2	50.4	84.1	---	77.8	69.0	81.0
AGS 2038	51.0	51.9	80.1	63.0	78.6	50.0	79.4
AGS 2055	---	65.0	90.2	---	89.2	---	89.7
Delta Grow 1000	---	51.4	91.3	---	88.6	---	90.0
Delta Grow 2700	62.0	51.1	77.7	---	76.5	68.7	77.1
Delta Grow 3500	---	56.6	76.8	---	74.9	---	75.9
Dixie Bell 500	---	53.8	82.1	---	79.8	---	81.0
Dixie Bell 620	53.9	51.7	80.1	79.6	76.6	67.6	78.4
Dixie Xtreme	53.5	49.4	74.7	70.5	69.6	69.2	72.2
Dixie McAlister	66.3	51.6	85.8	71.2	83.7	70.6	84.8
Dyna-Gro 9012	57.5	50.0	86.5	72.4	86.0	67.2	86.3
Dyna-Gro 9171	62.0	55.0	87.3	71.5	86.5	70.6	86.9
Dyna-Gro 9522	54.1	53.4	80.1	---	82.9	70.5	81.5
Dyna-Gro 9552	---	48.1	82.6	---	76.9	---	79.8
Go Wheat 2056	54.1	48.3	84.0	---	79.4	71.8	81.7
Go Wheat 2058	---	48.1	86.9	---	89.8	---	88.4
Pioneer 26R10	56.4	55.5	79.0	73.6	75.3	68.8	77.2
Pioneer 26R41	66.6	62.3	88.4	82.8	86.4	66.0	87.4
Pioneer 26R53	55.9	58.0	85.4	77.1	83.4	62.0	84.4
Pioneer 26R59	---	60.3	89.3	---	83.9	---	86.6
Pioneer 26R87	50.4	54.1	75.9	68.1	71.0	42.6	73.5
Progeny 243	---	36.6	76.7	---	75.2	---	76.0
Progeny 357	49.6	41.5	61.4	58.1	62.6	64.3	62.0
Progeny 410	---	10.7	49.2	---	45.9	---	47.6
Progeny 870	63.6	49.3	85.0	72.8	79.6	72.0	82.3
Syngenta Oakes	47.4	45.7	78.6	67.8	81.0	56.9	79.8
Syngenta SY Harrison	58.5	56.3	81.7	68.6	74.9	71.5	78.3
Syngenta SY Viper	---	51.8	84.9	---	81.5	---	83.2
USG 3013	---	49.4	74.9	68.1	72.9	---	73.9
USG 3201	64.7	53.2	88.0	69.2	80.5	71.1	84.3
USG 3404	52.5	50.5	78.8	72.5	79.2	68.9	79.0
USG 3438	61.5	53.4	85.3	69.4	84.4	69.4	84.9
USG 3523	65.9	51.5	73.5	66.5	77.7	65.7	75.6
VA Hilliard	---	55.9	89.0	---	88.6	---	88.8
Mean	58.4	50.8	81.3	71.0	79.1	66.6	80.2

*Keiser and Stuttgart data is from 2014 and 2015, Newport data is from 2014 and 2016, and Kibler, Marianna, and Rohwer data is from 2015 and 2016.

**Delta average is calculated only from Marianna and Rohwer from 2015 and 2016.

Table 3. Three-Year Average Yields (Bu/a) in Arkansas Wheat Performance Trials at Six Locations (2013-16).							
Variety/Brand Name	**Keiser***	**Kibler**	**Marianna**	**Newport***	**Rohwer**	**Stuttgart***	**Delta Avg.****
AgriMAXX 413	70.3	67.0	89.1	78.9	89.4	72.6	89.3
AgriMAXX 415	76.8	63.2	87.7	72.0	85.8	72.0	86.8
AgriMAXX 444	---	64.5	91.1	---	85.5	---	88.3
AgriMAXX 446	---	65.7	89.4	---	83.0	---	86.2
AGS 2038	61.8	62.8	84.4	67.8	83.7	55.7	84.1
AGS 2055	---	73.1	92.5	---	91.4	---	92.0
Dixie Bell 620	67.5	66.7	86.7	76.2	82.8	71.5	84.8
Dixie Xtreme	67.5	66.0	82.1	71.0	78.1	71.5	80.1
Dixie McAlister	74.5	67.2	90.2	72.7	87.8	71.3	89.0
Dyna-Gro 9012	69.0	64.8	91.4	72.5	87.0	71.2	89.2
Dyna-Gro 9171	70.7	68.8	91.2	70.9	90.4	73.1	90.8
Dyna-Gro 9522	---	66.5	88.4	---	85.6	---	87.0
Go Wheat 2056	---	66.1	88.7	---	85.1	---	86.9
Pioneer 26R10	67.7	69.0	84.3	69.8	81.7	69.3	83.0
Pioneer 26R41	75.3	75.6	91.9	78.4	91.3	68.1	91.6
Pioneer 26R53	68.7	68.8	88.6	75.0	88.5	65.9	88.6
Pioneer 26R87	62.2	67.0	82.2	70.9	78.6	48.9	80.4
Progeny 357	59.4	55.3	70.0	57.0	73.3	65.5	71.7
Progeny 870	69.2	64.7	91.7	69.0	85.9	72.4	88.8
Syngenta Oakes	57.1	57.9	82.4	69.5	85.3	60.5	83.9
Syngenta SY Harrison	69.4	71.7	88.1	72.0	81.8	73.6	85.0
USG 3013	70.8	64.9	82.6	66.5	80.5	71.2	81.6
USG 3201	74.1	66.1	89.0	68.0	86.6	74.1	87.8
USG 3404	---	65.9	86.8	---	85.5	---	86.3
USG 3438	70.7	67.7	91.5	69.8	88.7	73.5	90.1
USG 3523	75.2	64.9	79.0	66.8	83.3	69.5	81.2
Mean	**68.9**	**66.2**	**87.0**	**70.7**	**89.4**	**68.6**	**85.9**

*Keiser and Stuttgart data is from 2013, 2014, and 2015, Newport data is from 2013, 2014, and 2016, and Kibler, Marianna, and Rohwer data is from 2014, 2015, and 2016.

**Delta average is calculated from Marianna and Rohwer data from 2014, 2015, and 2016.

Table 4. Disease Reactions of Commercially Available Wheat Varieties in Arkansas Performance Trials, 2016.					
	Stripe Rust	Leaf Rust	Septoria	% Fusarium Head Blight	% Fusarium Head Blight
Variety/Brand Name	Rating	Rating	0-9 scale	Fayetteville (nursery)	Newport (nursery)
AgriMAXX 413	R	MS	2	2	3
AgriMAXX 415	R	MS	2	0	2
AgriMAXX 444	R	S	2	3	3
AgriMAXX 446	MS	S	3	3	7
AGS 2024	MS	MS	4	7	27
AGS 2038	MR	MS	2	20	28
AGS 2055	R	R	3	5	22
AGS 3000	R	R	5	0	22
Delta Grow 1000	R	R	2	0	2
Delta Grow 2700	R	S	3	2	3
Delta Grow 3500	S	MR	4	10	30
Delta Grow 7500	R	MS	3	0	3
Dixie Bell 125	VS	S	4	42	2
Dixie Bell 500	R	S	2	0	2
Dixie Bell 600	R	MS	2	0	5
Dixie Bell 620	R	MS	2	0	2
Dixie Xtreme	R	S	3	3	5
Dixie McAlister	R	MS	3	0	3
Dyna-Gro 9012	R	MS	2	0	3
Dyna-Gro 9171	R	MS	3	0	2
Dyna-Gro 9522	R	S	3	0	3
Dyna-Gro 9552	MS	S	3	3	3
Dyna-Gro 9642	R	S	3	0	0
Go Wheat 2056	R	MR	2	0	2
Go Wheat 2058	R	MS	3	2	2
Go Wheat 2059	MR	R	2	0	0
Pioneer 26R10	R	S	2	0	5
Pioneer 26R41	R	MR	2	0	7
Pioneer 26R53	R	MR	3	0	5
Pioneer 26R59	MR	MS	2	3	7
Pioneer 26R87	S	S	5	2	23
Progeny 243	VS	S	3	0	2
Progeny 357	MR	S	4	3	3
Progeny 410	VS	S	4	25	10
Progeny 870	R	MS	3	0	3
Syngenta Oakes	MS	S	4	5	8
Syngenta SY Harrison	R	MS	3	2	5
Syngenta SY Viper	R	MR	3	0	12
USG 3013	MR	S	3	2	5
USG 3201	R	MS	3	0	3
USG 3404	R	S	3	0	5
USG 3438	R	MS	2	0	3
USG 3523	MS	S	4	0	2
VA Hilliard	R	MR	2	0	5
Mean	---	---	**3**	**3**	**7**

R=Resistant, MR = Mod. Resistant, MS = Mod. Susceptible, S= Susceptible, VS = Very Susceptible

Table 5. Agronomic Characteristics of Commercially Available Varieties in Arkansas Performance Trials, 2015-16.							
	Test Wt.	Lodging	Plant Ht	Heading	Maturity	Relative	Awned
Variety/Brand Name	Lb/bu	0-9 scale	Inches	Date	Date	Maturity	Heads
AgriMAXX 413	54.8	0	33	15-Apr	26-May	Medium	Yes
AgriMAXX 415	55.2	0	32	15-Apr	25-May	Medium	Yes
AgriMAXX 444	53.8	0	34	17-Apr	27-May	Late	Yes
AgriMAXX 446	54.0	0	34	17-Apr	26-May	Late	Yes
AGS 2024	55.6	0	31	9-Apr	23-May	Early	Yes
AGS 2038	56.5	0	38	11-Apr	27-May	Early	Yes
AGS 2055	55.7	0	36	14-Apr	25-May	Medium	Yes
AGS 3000	56.6	0	31	3-Apr	12-May	Early	Yes
Delta Grow 1000	54.7	0	37	16-Apr	25-May	Medium	Yes
Delta Grow 2700	54.3	0	33	17-Apr	28-May	Late	Yes
Delta Grow 3500	55.6	0	31	7-Apr	21-May	Early	Yes
Delta Grow 7500	53.7	0	32	14-Apr	25-May	Medium	Yes
Dixie Bell 125	49.4	5	30	12-Apr	22-May	Early	No
Dixie Bell 500	53.9	0	33	16-Apr	27-May	Medium	Yes
Dixie Bell 600	53.0	0	35	16-Apr	27-May	Medium	Yes
Dixie Bell 620	54.0	0	33	16-Apr	27-May	Medium	Yes
Dixie Xtreme	52.9	0	35	15-Apr	28-May	Medium	No
Dixie McAlister	54.5	0	32	16-Apr	26-May	Medium	Yes
Dyna-Gro 9012	55.6	0	33	15-Apr	26-May	Medium	Yes
Dyna-Gro 9171	54.2	0	32	14-Apr	26-May	Medium	Yes
Dyna-Gro 9522	54.7	0	34	16-Apr	27-May	Medium	Yes
Dyna-Gro 9552	54.3	0	33	18-Apr	28-May	Late	Yes
Dyna-Gro 9642	53.5	0	34	17-Apr	26-May	Late	Yes
Go Wheat 2056	53.6	0	32	16-Apr	26-May	Medium	Yes
Go Wheat 2058	54.5	0	30	14-Apr	26-May	Medium	Yes
Go Wheat 2059	54.1	0	31	13-Apr	24-May	Early	No
Pioneer 26R10	54.5	0	33	16-Apr	27-May	Medium	Yes
Pioneer 26R41	54.1	0	32	16-Apr	25-May	Medium	Yes
Pioneer 26R53	56.3	0	31	16-Apr	25-May	Medium	Yes
Pioneer 26R59	53.3	0	30	16-Apr	26-May	Medium	Yes
Pioneer 26R87	57.4	0	33	9-Apr	22-May	Early	Yes
Progeny 243	54.4	0	35	14-Apr	23-May	Medium	Yes
Progeny 357	52.8	0	33	16-Apr	27-May	Medium	Yes
Progeny 410	46.3	0	33	15-Apr	27-May	Medium	No
Progeny 870	54.6	0	32	15-Apr	26-May	Medium	Yes
Syngenta Oakes	55.4	0	35	14-Apr	24-May	Medium	No
Syngenta SY Harrison	54.5	0	33	17-Apr	27-May	Late	Yes
Syngenta SY Viper	55.0	0	36	12-Apr	25-May	Early	No
USG 3013	53.2	0	35	16-Apr	29-May	Medium	No
USG 3201	56.0	0	33	15-Apr	26-May	Medium	Yes
USG 3404	54.5	0	34	17-Apr	28-May	Late	Yes
USG 3438	54.5	0	33	14-Apr	26-May	Medium	Yes
USG 3523	53.5	0	33	14-Apr	26-May	Medium	Yes
VA Hilliard	55.3	0	34	12-Apr	24-May	Early	Yes
Mean	**54.3**	**0**	**33**	**14-Apr**	**25-May**	**---**	**---**