Oklahoma Small Grains Variety Performance Tests 2010 - 2011

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www.wheat.okstate.edu

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2011 WHEAT CROP OVERVIEW

The 2010-2011 wheat production season can be characterized as record breaking, but not in a positive sense. The year was marked by record drought, record cold, and record heat that exacted a toll on the Oklahoma wheat crop. At the time of writing this report, 2011 Oklahoma wheat production is estimated to be approximately 74.8 million bushels or 38% less than 2010 (Table 1). Lower production was offset to some extent by higher prices with cash prices at harvest exceeding $8 per bushel at some locations.

Table 1. Oklahoma statistics for 2010 and 2011 production years

	2011	2010
Harvested Acres	3.4 million	3.9 million
Yield (bu/ac)	22	31
Total bushels	74.8 million	120.9 million

Most areas of the state had just enough moisture for wheat emergence in the fall of 2010. This moisture was quickly used but never replenished in southwestern Oklahoma and the western tier of counties in northern Oklahoma. As a result, early-sown wheat intended for grazing was parched by mid winter and never recovered. Most of the fields in this situation were "zeroed out" for insurance purposes and not harvested for grain. The same can be said for a good portion of the dryland wheat in the Oklahoma Panhandle where drought conditions were exacerbated by record low temperatures. This was especially true in Cimarron County where a mere 1.4 inches of precipitation occurred between planting and wheat maturity. Despite the harsh environmental conditions wheat at our Keyes test site averaged 22 bu/ac illustrating the benefits of fallow and confirming that wheat is an amazing plant.

A few light rains and relatively large snowfall events gave wheat in central and northcentral Oklahoma just enough moisture to make it through the winter in good condition. Given the relatively good condition of the wheat crop in this region during December and January and the favorable price outlook, most farmers chose to topdress at average to above-average rates. The condition of wheat in this area rapidly deteriorated as February, March, and April passed without appreciable precipitation, however, and a large portion of topdress N remained on the soil surface and unavailable to roots. Rains finally arrived in northcentral Oklahoma in May and were just in time to retain at least part of the yield potential present. These rains only added to the problem of too much moisture in northeastern Oklahoma where many growers were forced to aerially apply herbicides and nitrogen due to waterlogged soil conditions. Finally, Mother Nature offered a challenge for central and northcentral Oklahoma wheat producers in the form of late-May hail storms. The extent of hail damage is illustrated by the 19 bu/ac average yield at Kingfisher where wheat plots were estimated to be in the 35 – 45 bu/ac range prior to the hail event.

Lowest average yield among the OSU wheat variety test sites was at Gage (9 bu/ac) where plots were grazed during the winter and inadequate moisture was available for recovery after grazing. Grazing reduced grain yield of wheat by an average of 12 bu/ac at our Marshall site. Highest average yield was at the McLoud site (48 bu/ac), which was sown after a full-season corn crop in a corn/wheat/double-crop soybean rotation. Drought combined with heat during grain fill can frequently result in shriveled seed, but this was not the case in 2011. Test weights were generally 60 lb/bu or greater in early-harvested wheat but decreased slightly in later-harvested wheat.

Application of a foliar fungicide had no effect on average grain yield at Apache or Lahoma. This was not surprising, as very little foliar disease was present during the 2010-2011 production year. The most frequently observed disease of wheat in 2011 was barley yellow dwarf virus, which is transmitted by aphids. Infection probably occurred as a result of a late-winter or early-spring infestation of aphids and symptoms typically included purpling and yellowing but not stunting. In addition to barley yellow dwarf, there were a few reports of wheat streak mosaic virus and high plains virus in the Oklahoma Panhandle.

While weeds were a problem, reports of excessive dockage and foreign material were not as widespread as in 2010. This was probably due to multiple factors, not the least of which was greater emphasis on wheat quality by grain elevator managers. It was made clear in 2010 that stricter dockage and foreign material standards would be in place for 2011 and most growers heeded the warning by placing greater emphasis on timely and accurate weed control.

Methods

Cultural Practices. Conventional plots were eight rows wide with six-inch row spacing. No-till plots were seven rows wide with 7.5-inch row spacing. Plots were 20 feet long and wheel tracks were included in the plot area for yield calculation. Conventional till plots received 50 lb/ac of 18-46-0 in-furrow at planting. No-till plots received 5 gal/ac of 10-34-0 at planting. The Apache, El Reno, Marshall dual-purpose (DP) trials were sown at 120 lb/ac. All other locations were sown at 60 lb/ac. Grazing pressure, nitrogen fertilization, and insect and weed control decisions were made on a location-by-location basis and reflect standard management practices for the area.

Additional information on the Web

A copy of this publication as well as additional variety information and more information on wheat management can be found at

www.wheat.okstate.edu

Marketing rights

Breeding programs responsible for varietal release are indicated as the "source" in results tables. In many cases, however, a separate entity has the marketing rights for these varieties. For this reason, a list of wheat seed companies and the varieties they market is provided below.

AgriPro
Doans
Greer
Fannin
Jackpot
TAM 111
TAM 203
TAM 401

CO Wheat Res. Found.
Bill Brown
Hatcher

Husker Genetics
Mace

Kansas Wheat Alliance
Everest
Fuller
Jagger
Overley

Limagrain Cereal Seeds
T158

OK Foundation Seed
2174
Deliver
Endurance

Oklahoma Genetics
Billings
Centerfield
Duster
Garrison
Guymon (W)
OK Bullet
Pete
Ruby Lee

WestBred
Armour
Aspen (W)
Santa Fe
Shocker
WB-Cedar
WB-Stout
Winterhawk

Watley Seed
TAM 112

Partial financial support provided by the Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation

2011 Oklahoma Wheat Variety Trial Yield Summary

Variety	Afton	Alva	Apache	Apache Fung	Balko	Buffalo	Cherokee	El Reno	Elk City	Frederick	Gage	Goodwell Irr
	grain yield (bu/ac)											
2174	-	-	-	-	-	-	-	-	-	-	-	-
Armour	44	43	18	19	43	14	17	24	31	25	8	42
Aspen	-	-	-	-	-	-	-	-	-	-	-	35
Bill Brown	-	-	-	-	40	-	-	-	-	-	-	32
Billings	38	40	20	22	39	13	19	28	23	18	10	36
Centerfield	21	36	-	-	-	11	17	32	30	28	11	-
Deliver	-	34	-	-	-	-	15	30	-	-	7	-
Doans	27	42	16	17	37	17	20	32	26	20	10	31
Duster	37	49	22	22	45	18	27	40	28	29	9	41
Endurance	36	43	18	19	41	14	24	38	31	22	10	37
Everest	43	-	19	18	-	-	24	39	-	23	-	-
Fannin	-	-	13	12	-	-	-	24	24	18	-	-
Fuller	35	40	26	26	36	19	26	34	31	24	10	30
Garrison	-	42	19	20	37	16	19	32	32	18	-	-
Greer	32	39	19	19	40	18	28	32	30	26	10	31
Guymon	-	-	-	-	-	-	-	-	-	-	-	28
Hatcher	-	-	-	-	41	-	-	-	-	-	-	40
Jackpot	32	36	21	19	41	15	21	31	26	26	10	29
Jagger	32	41	20	21	36	14	28	33	24	26	9	32
Mace	-	-	-	-	37	-	-	-	-	-	-	35
OK Bullet	29	40	20	20	34	15	21	36	24	25	10	32
OK Rising	-	-	-	-	-	-	-	-	-	-	-	28
Overley	23	46	-	-	-	-	23	34	-	27	-	-
Pete	-	-	16	18	-	-	-	29	22	25	-	-
Ruby Lee	-	-	-	-	-	-	-	37	-	26	-	-
Santa Fe	38	41	19	19	37	13	23	33	29	26	11	28
Shocker	21	-	-	-	-	-	15	28	-	-	-	-
T158	-	-	-	-	42	16	-	-	-	-	-	39
TAM 111	-	41	-	-	41	9	-	-	28	-	9	41
TAM 112	-	55	-	-	43	20	-	-	30	-	10	44
TAM 203	37	44	29	30	-	17	32	36	29	23	9	-
TAM 401	-	40	17	19	-	-	25	30	28	24	7	-
WB-Cedar	32	-	-	-	-	-	19	35	-	-	-	-
WB-Stout	33	38	20	21	40	16	11	29	21	21	9	35
Winterhawk	-	-	-	-	44	22	-	-	-	-	10	38
OK05312	-	-	-	-	44	25	-	-	-	-	-	-
OK05511-RHf2	-	-	-	-	-	-	-	-	22	24	-	-
OK06336	-	-	-	-	-	-	-	-	-	-	-	-
OK07209	43	47	25	27	-	-	24	36	26	29	-	-
OK07214	46	45	20	25	-	-	20	-	-	-	-	39
OK07231	-	-	-	-	-	-	-	33	-	-	-	-
OK07S117	-	-	-	-	-	-	-	19	-	-	-	-
OK08328	-	-	25	28	-	-	-	-	-	29	-	-
Mean	34	42	20	21	40	16	22	32	27	24	9	35
$LSD_{(0.05)}$	7	10	4	4	4	6	7	8	6	5	3	9

Partial financial support provided by the Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation

2011 Oklahoma Wheat Variety Trial Yield Summary

Variety	Homestead	Hooker	Keyes	Kildare	Kingfisher	Lahoma	Lahoma Fung	Lamont	Marshall DP	Marshall GO	McLoud	Olustee
	grain yield (bu/ac)											
2174	-	-	-	-	-	-	-	-	-	-	48	-
Armour	39	23	19	40	20	45	50	43	13	33	47	16
Aspen	-	-	-	-	-	-	-	-	-	-	-	-
Bill Brown	-	25	21	-	-	-	-	-	-	-	-	-
Billings	37	20	19	31	21	46	47	36	14	29	46	11
Centerfield	36	-	-	37	21	42	36	39	16	31	47	19
Deliver	30	-	-	-	17	32	29	37	19	26	-	-
Doans	41	21	28	29	21	43	43	37	21	27	42	16
Duster	39	21	23	51	27	53	52	47	23	32	52	20
Endurance	41	21	20	41	17	46	48	46	24	30	47	18
Everest	42	-	-	36	16	48	50	46	24	30	48	15
Fannin	-	-	-	-	-	-	-	-	-	-	-	11
Fuller	36	20	21	39	23	46	46	41	20	32	45	18
Garrison	39	-	-	46	21	44	47	40	13	30	-	12
Greer	39	-	-	49	16	43	42	44	20	30	52	19
Guymon	-	-	-	-	-	-	-	-	-	-	-	-
Hatcher	-	24	19	-	-	-	-	-	-	-	-	-
Jackpot	38	23	22	33	17	41	38	39	19	32	46	18
Jagger	40	19	21	31	23	48	46	36	19	32	42	17
Mace	-	24	17	-	-	-	-	-	-	-	-	-
OK Bullet	34	20	26	40	18	44	47	40	15	26	41	17
OK Rising	-	-	-	-	-	-	-	-	-	-	-	-
Overley	43	-	-	36	15	43	41	48	14	31	47	20
Pete	-	-	-	-	18	40	39	-	14	29	-	17
Ruby Lee	-	-	-	40	-	-	-	-	-	-	53	-
Santa Fe	42	-	-	43	16	47	45	44	15	26	42	19
Shocker	30	-	-	34	10	39	38	46	13	27	52	-
T158	-	22	23	-	-	-	-	-	-	-	-	-
TAM 111	-	21	23	-	-	-	-	-	-	-	-	-
TAM 112	-	24	33	-	-	-	-	-	-	-	-	-
TAM 203	37	-	-	28	27	49	49	43	24	24	48	19
TAM 401	35	-	-	-	14	41	42	44	14	30	-	15
WB-Cedar	37	-	-	26	13	44	49	39	24	29	49	-
WB-Stout	34	18	23	36	14	49	43	38	14	26	46	11
Winterhawk	-	-	-	-	-	-	-	-	-	-	-	-
OK05312	-	25	24	-	-	-	-	-	-	-	-	-
OK05511-RHf2	-	-	-	-	-	-	-	-	-	-	-	-
OK06336	-	-	-	38	-	-	-	-	-	-	50	-
OK07209	-	-	-	52	25	52	52	-	22	-	54	-
OK07214	-	-	-	-	-	51	52	-	-	-	56	14
OK07231	34	-	-	35	-	45	42	-	-	-	-	-
OK07S117	-	-	-	-	-	-	-	-	-	-	-	-
OK08328	-	-	-	-	-	-	-	-	-	-	-	-
Mean	37	22	22	38	19	45	45	42	18	29	48	16
$LSD_{(0.05)}$	6	3	5	12	7	8	8	8	4	5	5	1

Partial financial support provided by the Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation

Afton Wheat Variety Trial

Cooperator: Greg Leonard | **Tillage: Conventional till**
Soil type: Parsons silt loam | **Management: Grain only**
Planting date: 10-05-10 | **Previous crop: Corn**
Harvest date: 06-16-11 | **Soil test: pH = 6.4, P = 107, K = 270**

		Grain Yield		
Source	Variety	2010-11	2-Year	3-Year
		----------bu/ac----------		
WestBred	Armour	44	50	45
KSU	Everest	43	51	-
OSU	Billings	38	46	38
WestBred	Santa Fe	38	43	37
OSU	Duster	37	42	36
TAMU	TAM 203	37	39	36
OSU	Endurance	36	46	41
KSU	Fuller	35	40	36
WestBred	WB-Stout	33	-	-
AgriPro	Greer	32	42	-
AgriPro	Jackpot	32	44	35
KSU	Jagger	32	41	35
WestBred	WB-Cedar	32	-	-
OSU	OK Bullet	29	37	31
AgriPro	Doans	27	-	-
KSU	Overley	23	36	29
OSU	Centerfield	21	32	29
WestBred	Shocker	21	36	32
Experimentals				
	OK07214	46	-	-
	OK07209	43	-	-
	Mean	34	42	35
	LSD $_{(0.05)}$	7	4	4

Notes: Grain sample size was too small for test weight measurement
Yield of Overley was affected by severe bird damage

Partial financial support provided by the Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation

Alva Wheat Variety Trial

Cooperator: Wes Mallory
Soil type: Grant silt loam
Planting date: 10-06-10
Harvest date: 06-08-11

Tillage: Conventional till
Management: Grain only
Previous crop: Wheat
Soil test: pH = 5.2, P = 131, K = 659

Source	Variety	Grain Yield			Test Weight
		2010-11	2-Year	3-Year	2010-11
		----------bu/ac----------			-----lb/bu-----
TAMU	TAM 112	55	47	46	62.4
OSU	Duster	49	47	47	62.4
KSU	Overley	46	43	43	61.4
TAMU	TAM 203	44	38	41	58.7
WestBred	Armour	43	-	-	60.4
OSU	Endurance	43	40	44	62.0
AgriPro	Doans	42	36	38	62.5
OSU	Garrison	42	44	-	62.1
KSU	Jagger	41	37	39	59.5
WestBred	Santa Fe	41	37	41	61.1
TAMU	TAM 111	41	43	42	61.8
OSU	Billings	40	37	40	62.1
KSU	Fuller	40	36	38	60.9
OSU	OK Bullet	40	37	38	61.8
TAMU	TAM 401	40	37	-	59.7
AgriPro	Greer	39	40	-	57.7
WestBred	WB-Stout	38	-	-	58.8
OSU	Centerfield	36	35	38	60.9
AgriPro	Jackpot	36	34	38	59.9
OSU	Deliver	34	33	37	61.8
Experimentals					
	OK07209	47	-	-	-
	OK07214	45	-	-	63.1
	Mean	42	39	41	61.0
	LSD $_{(0.05)}$	10	5	4	1.5

Notes: 2010-11 grain yield affected by season-long drought.

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Apache Wheat Variety Trial

Cooperator: Bryan Vail
Soil type: Hollister silt loam
Planting date: 10-28-10
Harvest date: 05-31-11

Management: No-till grain only
Soil test: pH = 6.0, P = 106, K = 501
Previous crop: Sesame
Fungicide = 9 oz/A Twinline on 08 April 2011

		Grain Yield							Test Weight		
		2010-11			2-Year				2010-11		
Source	Variety	No Fungicide	Fungicide	*Diff.*	No Fungicide	Fungicide	*Diff.*		No Fungicide	Fungicide	*Diff.*
		bu/ac							lb/bu		
TAMU	TAM 203	29	30	1	41	42	1		57.2	57.5	0.2
KSU	Fuller	26	26	0	39	38	-1		60.5	60.5	0.0
OSU	Duster	22	22	0	45	45	0		60.5	60.9	0.5
AgriPro	Jackpot	21	19	-2	39	41	2		59.7	59.6	0.0
OSU	Billings	20	22	2	-	-	-		59.4	59.9	0.5
KSU	Jagger	20	21	1	34	37	3		59.5	59.9	0.4
WestBred	WB-Stout	20	21	1	-	-	-		56.9	57.3	0.4
OSU	OK Bullet	20	20	0	33	37	4		60.7	60.7	0.0
OSU	Garrison	19	20	1	-	-	-		60.5	60.7	0.2
AgriPro	Greer	19	19	0	37	38	0		57.4	58.2	0.8
WestBred	Santa Fe	19	19	0	41	36	-5		60.3	60.2	-0.1
KSU	Everest	19	18	-1	-	-	-		60.5	60.8	0.3
WestBred	Armour	18	19	1	-	-	-		59.4	59.6	0.2
OSU	Endurance	18	19	1	38	39	1		60.4	60.6	0.2
TAMU	TAM 401	17	19	2	40	37	-3		58.4	58.8	0.5
OSU	Pete	16	18	2	34	35	1		60.9	61.5	0.6
AgriPro	Doans	16	17	1	38	35	-2		60.4	60.6	0.1
AgriPro	Fannin	13	12	-1	34	34	0		60.3	60.5	0.2
Experimentals											
	OK08328	25	28	3	-	-	-		60.0	60.4	0.4
	OK07209	25	27	2	-	-	-		61.6	62.0	0.3
	OK07214	20	25	5	-	-	-		60.2	61.0	0.7
	Mean	20	21	1	38	38	0		59.7	60.0	0.3
	LSD $_{(0.05)}$	4			4				0.8		

Notes: 2010-11 grain yield affected by severe, season-long drought.
Negative responses to fungicide application are statistically nonsignificant and should be regarded as no response

Partial financial support provided by the Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation

Balko Wheat Variety Trial

Cooperator: Steve Franz | **Tillage: No-till**
Soil type: Ulysses-Richfield complex | **Management: Grain only**
Planting date: 10-06-10 | **Previous crop: Sorghum/Fallow**
Harvest date: 06-09-11 | **Soil test: pH = 8.0, P = 65, K = 1180**

		Grain Yield			Test Weight
Source	Variety	2010-11	2-Year	3-Year	2010-11
		----------bu/ac----------			-----lb/bu-----
OSU	Duster	45	59	56	61.3
WestBred	Winterhawk	44	59	56	61.2
WestBred	Armour	43	-	-	60.3
TAMU	TAM 112	43	58	58	60.9
LCS	T158	42	-	-	61.2
OSU	Endurance	41	53	55	61.4
CSU	Hatcher	41	-	-	60.4
AgriPro	Jackpot	41	58	54	60.7
TAMU	TAM 111	41	60	58	60.4
CSU	Bill Brown	40	-	-	61.5
AgriPro	Greer	40	-	-	58.0
WestBred	WB-Stout	40	-	-	57.7
OSU	Billings	39	57	-	59.0
AgriPro	Doans	37	54	53	60.4
OSU	Garrison	37	53	-	59.2
UNL	Mace	37	51	52	59.2
WestBred	Santa Fe	37	51	51	60.9
KSU	Fuller	36	55	52	60.5
KSU	Jagger	36	51	52	59.9
OSU	OK Bullet	34	51	50	58.5
Experimentals					
	OK05312	44	61	61	60.4
	Mean	40	55	54	60.1
	LSD $_{(0.05)}$	4	3	3	1.1

Notes: 2010-11 grain yield affected by severe, season-long drought.

Partial financial support provided by the Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation

Buffalo Wheat Variety Trial

Cooperator: NRCS
Soil type: St. Paul silt loam
Planting date: 10-14-10
Harvest date: 06-09-11

Tillage: Conventional till
Management: Grain only
Previous crop: Wheat
Soil test: pH = 7.4, P = 118, K = 658

Source	Variety	Grain Yield			Test Weight
		2010-11	2-Year	3-Year	2010-11
		----------bu/ac----------			-----lb/bu-----
WestBred	Winterhawk	22	30	42	60.6
TAMU	TAM 112	20	26	38	59.0
KSU	Fuller	19	21	33	58.1
OSU	Duster	18	24	39	60.0
AgriPro	Greer	18	20	-	55.5
AgriPro	Doans	17	22	35	60.2
TAMU	TAM 203	17	21	35	55.7
OSU	Garrison	16	-	-	59.7
LCS	T158	16	-	-	56.8
WestBred	WB-Stout	16	-	-	56.5
AgriPro	Jackpot	15	21	33	57.5
OSU	OK Bullet	15	20	33	59.0
WestBred	Armour	14	-	-	57.2
OSU	Endurance	14	23	40	59.5
KSU	Jagger	14	20	32	57.3
OSU	Billings	13	18	-	58.6
WestBred	Santa Fe	13	19	31	58.9
OSU	Centerfield	11	19	33	57.9
TAMU	TAM 111	9	16	29	58.7
Experimentals					
	OK05312	25	-	-	62.2
	Mean	16	21	35	58.5
	LSD $_{(0.05)}$	6	5	4	0.7

Notes: 2010-11 grain yield affected by severe, season-long drought.

Partial financial support provided by the Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation

Cherokee Wheat Variety Trial

Cooperator: Kenneth Failes
Soil type: Dale silt loam
Planting date: 09-29-10
Harvest date: 06-08-11

Tillage: Conventional till
Management: Dual purpose
Previous crop: Wheat
Soil test: pH = 5.9, P = 125, K = 773

Source	Variety	Grain Yield			Test Weight
		2010-11	2-Year	3-Year	2010-11
		----------bu/ac----------			-----lb/bu-----
TAMU	TAM 203	32	26	32	56.7
AgriPro	Greer	28	29	-	57.2
KSU	Jagger	28	26	29	59.2
OSU	Duster	27	30	34	60.6
KSU	Fuller	26	24	29	58.7
TAMU	TAM 401	25	24	-	57.9
OSU	Endurance	24	27	34	59.8
KSU	Everest	24	28	-	60.2
KSU	Overley	23	25	29	59.3
WestBred	Santa Fe	23	23	29	59.6
AgriPro	Jackpot	21	22	26	58.3
OSU	OK Bullet	21	21	28	60.0
AgriPro	Doans	20	20	27	60.3
OSU	Billings	19	21	-	59.6
OSU	Garrison	19	24	-	58.7
WestBred	WB-Cedar	19	-	-	58.1
WestBred	Armour	17	-	-	56.6
OSU	Centerfield	17	19	26	58.4
OSU	Deliver	15	19	25	59.2
WestBred	Shocker	15	17	22	57.1
WestBred	WB-Stout	11	-	-	55.9
Experimentals					
	OK07209	24	-	-	61.0
	OK07214	20	-	-	59.4
	Mean	22	24	28	58.8
	LSD $_{(0.05)}$	7	4	3	1.7

Notes: 2010-11 grain yield affected by severe, season-long drought.

Partial financial support provided by the Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation

El Reno Wheat Variety Trial

Cooperator: Bornemann Farms
Tillage: Conventional till
Soil type: Pond Creek silt loam
Management: Dual purpose
Planting date: 09-20-10
Previous crop: Wheat
Harvest date: 06-06-11
Soil test: pH = 6.7, P = 61, K = 337

		Grain Yield			Test Weight
Source	Variety	2010-11	2-Year	3-Year	2010-11
		----------bu/ac----------			-----lb/bu-----
OSU	Duster	40	50	46	60.9
KSU	Everest	39	-	-	60.9
OSU	Endurance	38	49	47	59.1
OSU	Ruby Lee	37	47	43	61.3
OSU	OK Bullet	36	42	36	60.6
TAMU	TAM 203	36	41	38	57.1
WestBred	WB-Cedar	35	-	-	60.1
KSU	Fuller	34	45	39	59.5
KSU	Overley	34	44	37	61.0
KSU	Jagger	33	40	33	58.9
WestBred	Santa Fe	33	43	40	59.8
OSU	Centerfield	32	39	36	58.5
AgriPro	Doans	32	43	41	60.6
OSU	Garrison	32	41	-	59.4
AgriPro	Greer	32	41	-	56.7
AgriPro	Jackpot	31	48	41	59.5
OSU	Deliver	30	39	38	59.4
TAMU	TAM 401	30	45	-	57.6
OSU	Pete	29	44	34	59.5
WestBred	WB-Stout	29	-	-	56.9
OSU	Billings	28	45	37	59.6
WestBred	Shocker	28	40	35	59.5
WestBred	Armour	24	-	-	58.6
AgriPro	Fannin	24	41	34	59.9
Experimentals					
	OK07209	36	-	-	61.0
	OK07231	33	42	-	59.2
	OK07S117	19	-	-	57.8
	Mean	32	43	39	59.4
	LSD $_{(0.05)}$	8	7	5	1.1

Notes: 2010-11 grain yield affected by severe, season-long drought.

Partial financial support provided by the Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation

Elk City Wheat Variety Trial

Cooperator: Carl Simon | **Tillage: No-till**
Soil type: Grandfield sandy loam | **Management: Grain only**
Planting date: 10-21-10 | **Previous crop: Wheat**
Harvest date: 06-01-11 | **Soil test: pH = 5.9, P = 38, K = 289**

		Grain Yield			Test Weight
Source	Variety	2010-11	2-Year*	3-Year*	2010-11
		----------bu/ac----------			-----lb/bu-----
OSU	Garrison	32	-	-	59.4
WestBred	Armour	31	27	-	59.4
OSU	Endurance	31	28	29	59.6
KSU	Fuller	31	27	28	59.9
OSU	Centerfield	30	27	26	58.7
AgriPro	Greer	30	-	-	57.7
TAMU	TAM 112	30	28	-	59.8
WestBred	Santa Fe	29	28	27	60.3
TAMU	TAM 203	29	28	-	57.5
OSU	Duster	28	25	26	60.8
TAMU	TAM 111	28	27	27	59.6
TAMU	TAM 401	28	-	-	57.4
AgriPro	Doans	26	26	26	60.2
AgriPro	Jackpot	26	21	22	60.4
AgriPro	Fannin	24	-	-	59.8
KSU	Jagger	24	23	24	58.1
OSU	OK Bullet	24	25	27	59.1
OSU	Billings	23	-	-	59.1
OSU	Pete	22	19	-	60.2
WestBred	WB-Stout	21	-	-	56.4
Experimentals					
	OK07209	26	-	-	61.1
	OK05511-RHf2	22	-	-	59.6
	Mean	27	26	26	59.3
	LSD $_{(0.05)}$	6	4	2	1

Notes: * Two and three-year averages include 2009 and 2008 data, respectively
2010-11 grain yield affected by severe, season-long drought.

Frederick Wheat Variety Trial

Cooperator: Great Plains Technology Center **Tillage: No-till**
Soil type: Tillman and Foard silt loam **Management: Grain only**
Planting date: 11-01-10 **Previous crop: Canola**
Harvest date: 05-26-11 **Soil test: pH = 7.8, P = 25, K = 691**

		Grain Yield		Test Weight
Source	Variety	2010-11	2-Year	2010-11
		----------bu/ac---------		-----lb/bu-----
OSU	Duster	29	43	60.5
OSU	Centerfield	28	37	59.3
KSU	Overley	27	32	60.3
AgriPro	Greer	26	37	57.6
AgriPro	Jackpot	26	38	59.6
KSU	Jagger	26	28	59.2
OSU	Ruby Lee	26	-	60.7
WestBred	Santa Fe	26	33	59.2
WestBred	Armour	25	-	59.4
OSU	OK Bullet	25	35	59.6
OSU	Pete	25	33	61.0
KSU	Fuller	24	33	59.5
TAMU	TAM 401	24	34	56.9
KSU	Everest	23	-	60.1
TAMU	TAM 203	23	30	57.7
OSU	Endurance	22	29	59.5
WestBred	WB-Stout	21	-	56.6
AgriPro	Doans	20	33	59.7
OSU	Billings	18	-	58.7
AgriPro	Fannin	18	31	60.2
OSU	Garrison	18	-	59.8
Experimentals				
	OK08328	29	-	59.3
	OK07209	29	-	61.0
	OK05511-RHf2	24	-	59.8
	Mean	24	34	59.4
	LSD $_{(0.05)}$	5	4	0.7

Notes: 2010-11 grain yield affected by severe, season-long drought.

Partial financial support provided by the Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation

Gage Wheat Variety Trial

Cooperator: Curtis Torrance
Soil type: St. Paul silt loam
Planting date: 09-28-10
Harvest date: 06-07-11

Tillage: Conventional till
Management: Dual purpose
Previous crop: Wheat
Soil test: pH = 7.4, P = 60, K = 775

		Grain Yield			Test Weight
Source	Variety	2010-11	2-Year	3-Year	2010-11
		----------bu/ac----------			-----lb/bu-----
OSU	Centerfield	11	17	20	59.0
WestBred	Santa Fe	11	16	19	59.0
OSU	Billings	10	16	-	59.0
AgriPro	Doans	10	16	19	60.2
OSU	Endurance	10	14	19	59.2
KSU	Fuller	10	15	18	58.3
AgriPro	Greer	10	15	-	57.9
AgriPro	Jackpot	10	14	18	59.2
OSU	OK Bullet	10	17	19	58.9
TAMU	TAM 112	10	18	22	58.1
WestBred	Winterhawk	10	17	19	60.6
OSU	Duster	9	16	20	59.4
KSU	Jagger	9	16	20	58.0
TAMU	TAM 111	9	16	19	57.3
TAMU	TAM 203	9	15	19	56.1
WestBred	WB-Stout	9	-	-	56.6
WestBred	Armour	8	-	-	57.3
OSU	Deliver	7	14	17	59.9
TAMU	TAM 401	7	13	-	55.4
	Mean	9	16	19	58.4
	LSD $_{(0.05)}$	3	3	2	1.1

Notes: 2010-11 grain yield affected by severe, season-long drought. Regrowth after grazing was minimal.

Partial financial support provided by the Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation

Goodwell Irrigated Wheat Variety Trial

Cooperator: OK Panhandle Research and Extension Center
Soil type: Richfield clay loam **Tillage: No-till**
Planting date: 10-06-10 **Management: Grain only**
Harvest date: 06-22-11 **Previous crop: Corn**

Source	Variety	Grain Yield 2010-11	Grain Yield 2-Year	Test Weight 2010-11
		----------bu/ac---------		-----lb/bu-----
TAMU	TAM 112	44	55	57.3
WestBred	Armour	42	-	56.2
OSU	Duster	41	54	56.1
TAMU	TAM 111	41	57	57.7
CSU	Hatcher	40	-	56.2
LCS	T158	39	-	57.1
WestBred	Winterhawk	38	52	56.6
OSU	Endurance	37	47	57.3
OSU	Billings	36	51	54.1
WestBred	Aspen (W)	35	51	50.6
UNL	Mace	35	48	55.7
WestBred	WB-Stout	35	-	52.8
CSU	Bill Brown	32	-	56.2
KSU	Jagger	32	44	54.8
OSU	OK Bullet	32	45	55.6
AgriPro	Doans	31	44	57.6
AgriPro	Greer	31	48	52.5
KSU	Fuller	30	45	54.7
AgriPro	Jackpot	29	45	54.3
OSU	Guymon (W)	28	43	56.2
OSU	OK Rising (W)	28	44	55.0
WestBred	Santa Fe	28	41	54.6
Experimentals				
	OK07214	39		55.8
	Mean	35	48	55.4
	LSD $_{(0.05)}$	9	6	2.1

Notes: W = hard white wheat

Irrigation was supplied on a limited basis and drought stress was present during the late vegetative and early reproductive stages of growth. Grain yields were were reduced approximately 10 - 15% by spring freeze injury.

Partial financial support provided by the Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation

Homestead Wheat Variety Trial

Cooperator: Brook Strader
Soil type: Canadian fine sandy loam
Planting date: 10-07-10
Harvest date: 06-02-11

Tillage: No-till
Management: Grain only
Previous crop: Wheat
Soil test: pH = 5.9, P = 36, K = 459

		Grain Yield			Test Weight
Source	Variety	2010-11	2-Year	3-Year	2010-11
		----------bu/ac----------			-----lb/bu-----
KSU	Overley	43	42	39	60.8
KSU	Everest	42	-	-	60.0
WestBred	Santa Fe	42	39	39	60.2
AgriPro	Doans	41	39	37	61.7
OSU	Endurance	41	42	41	59.3
KSU	Jagger	40	35	33	59.2
WestBred	Armour	39	-	-	59.5
OSU	Duster	39	45	42	60.0
OSU	Garrison	39	-	-	57.6
AgriPro	Greer	39	42	-	56.6
AgriPro	Jackpot	38	41	38	59.8
OSU	Billings	37	40	-	59.4
TAMU	TAM 203	37	38	38	57.7
WestBred	WB-Cedar	37	-	-	60.5
OSU	Centerfield	36	40	38	58.8
KSU	Fuller	36	39	38	59.7
TAMU	TAM 401	35	38	-	57.2
OSU	OK Bullet	34	35	35	60.5
WestBred	WB-Stout	34	-	-	57.2
OSU	Deliver	30	36	35	60.2
WestBred	Shocker	30	33	34	58.5
Experimentals					
	OK07231	34	-	-	58.9
	Mean	37	39	38	59.2
	LSD $_{(0.05)}$	6	3	3	0.6

Notes: 2010-11 grain yield affected by severe, season-long drought.

Partial financial support provided by the Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation

Hooker Wheat Variety Trial

Cooperator: Dan and Earnst Herald
Soil type: Dalhart fine sandy loam
Planting date: 10-06-10
Harvest date: 06-15-11

Tillage: No-till
Management: Grain only
Previous crop: Sorghum/Fallow
Soil test: pH = 7.3, P = 53, K = 789

		Grain Yield			Test Weight
Source	Variety	2010-11	2-Year	3-Year	2010-11
		----------bu/ac----------			-----lb/bu-----
CSU	Bill Brown	25	-	-	55.9
CSU	Hatcher	24	-	-	54.5
UNL	Mace	24	47	41	54.7
TAMU	TAM 112	24	53	44	55.5
WestBred	Armour	23	-	-	54.0
AgriPro	Jackpot	23	53	42	55.1
LCS	T158	22	-	-	56.0
AgriPro	Doans	21	47	38	54.9
OSU	Duster	21	47	37	55.2
OSU	Endurance	21	44	37	56.4
TAMU	TAM 111	21	50	41	54.3
OSU	Billings	20	52	-	54.6
KSU	Fuller	20	48	38	54.0
OSU	OK Bullet	20	45	36	54.6
KSU	Jagger	19	49	40	54.9
WestBred	WB-Stout	18	-	-	52.0
Experimentals					
	OK05312	25	42	-	56.4
	Mean	22	48	39	54.9
	LSD $_{(0.05)}$	3	3	2	1.1

Notes: 2010-11 grain yield affected by severe, season-long drought.

Partial financial support provided by the Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation

Keyes Wheat Variety Trial

Cooperator: J. B. Stewart
Soil type: Richfield clay loam
Planting date: 09-28-10
Harvest date: 06-15-11

Tillage: No-till
Management: Grain only
Previous crop: Wheat/Fallow

Source	Variety	Grain Yield			Test Weight
		2010-11	2-Year	3-Year	2010-11
		----------bu/ac----------			-----lb/bu-----
TAMU	TAM 112	33	37	40	60.6
AgriPro	Doans	28	33	34	57.4
OSU	OK Bullet	26	32	33	59.3
OSU	Duster	23	32	36	58.7
LCS	T158	23	-	-	60.2
TAMU	TAM 111	23	31	37	60.5
WestBred	WB-Stout	23	-	-	58.4
AgriPro	Jackpot	22	32	32	58.2
CSU	Bill Brown	21	-	-	59.9
KSU	Fuller	21	30	32	58.8
KSU	Jagger	21	33	34	58.6
OSU	Endurance	20	30	37	59.9
WestBred	Armour	19	-	-	58.9
OSU	Billings	19	28	-	59.8
CSU	Hatcher	19	-	-	59.6
UNL	Mace	17	26	34	57.6
Experimentals					
	OK05312	24	35	38	57.6
	Mean	22	32	35	59.1
	LSD $_{(0.05)}$	5	4	4	2.8

Notes: 2010-11 grain yield affected by severe, season-long drought. Total rainfall between planting and maturity was 1.4 inches. Grain yields were were reduced approximately 25% by spring freeze injury just prior to flowering.

Partial financial support provided by the Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation

Kildare Wheat Variety Trial

Cooperator: Don Schieber | **Tillage: No-till**
Soil type: Tabler silt loam | **Management: Grain only**
Planting date: 10-18-10 | **Previous crop: Soybean**
Harvest date: 06-10-11 | **Soil test: pH = 5.8, P = 116, K = 385**

		Grain Yield			Test Weight
Source	Variety	2010-11	2-Year*	3-Year*	2010-11
		----------bu/ac----------			-----lb/bu-----
OSU	Duster	51	47	49	60.7
AgriPro	Greer	49	-	-	56.9
OSU	Garrison	46	-	-	59.9
WestBred	Santa Fe	43	41	48	58.5
OSU	Endurance	41	36	42	58.5
WestBred	Armour	40	35	-	57.4
OSU	OK Bullet	40	34	36	59.7
OSU	Ruby Lee	40	42	-	60.3
KSU	Fuller	39	36	45	58.1
OSU	Centerfield	37	34	37	57.3
KSU	Everest	36	-	-	59.8
KSU	Overley	36	31	35	59.3
WestBred	WB-Stout	36	-	-	55.3
WestBred	Shocker	34	33	41	58.3
AgriPro	Jackpot	33	32	39	59.0
OSU	Billings	31	31	-	58.3
KSU	Jagger	31	31	36	56.8
AgriPro	Doans	29	25	34	58.7
TAMU	TAM 203	28	32	-	55.8
WestBred	WB-Cedar	26	-	-	58.4
Experimentals					
	OK07209	52	-	-	61.8
	OK06336	38	-	-	57.8
	OK07231	35	-	-	59.1
	Mean	38	35	40	58.5
	LSD $_{(0.05)}$	12**	6	5	0.9

Notes: * Two and three-year averages include 2009 and 2008 data, respectively
** Dry soil conditions resulted in uneven emergence and likely increased 210-2011 LSD
2010-11 grain yield affected by severe, season-long drought.

Kingfisher Wheat Variety Trial

Cooperator: Rodney Mueggenborg
Soil type: Tillman silt loam
Planting date: 10-18-10
Harvest date: 06-03-11

Tillage: Conventional till
Management: Grain only
Previous crop: Wheat
Soil test: pH = 6.3, P = 33, K = 387

Source	Variety	Grain Yield			Test Weight
		2010-11	2-Year	3-Year	2010-11
		----------bu/ac----------			-----lb/bu-----
OSU	Duster	27	44	46	61.8
TAMU	TAM 203	27	37	38	57.6
KSU	Fuller	23	38	36	60.2
KSU	Jagger	23	34	32	60.0
OSU	Billings	21	37	35	60.5
OSU	Centerfield	21	35	35	60.0
AgriPro	Doans	21	38	39	60.5
OSU	Garrison	21	38	-	60.6
WestBred	Armour	20	-	-	59.8
OSU	OK Bullet	18	35	36	60.4
OSU	Pete	18	37	33	61.6
OSU	Deliver	17	33	34	61.0
OSU	Endurance	17	36	39	61.5
AgriPro	Jackpot	17	37	36	59.8
KSU	Everest	16	-	-	60.7
AgriPro	Greer	16	34	-	58.2
WestBred	Santa Fe	16	34	36	60.4
KSU	Overley	15	33	32	60.3
TAMU	TAM 401	14	32	-	58.9
WestBred	WB-Stout	14	-	-	58.7
WestBred	WB-Cedar	13	-	-	58.4
WestBred	Shocker	10	31	29	58.7
Experimentals					
	OK07209	25	-	-	61.7
	Mean	19	36	36	60.1
	LSD $_{(0.05)}$	7	4	3	0.9

Notes: A hail storm on 23 May 2011 caused severe lodging and shattering. Yield losses were estimated to be 40 - 60%. Additionally, the 2010-11 grain yield was affected by severe, season-long drought.

Lahoma Wheat Variety Trial

Cooperator: North Central Research Station | **Management: Conventional till** | **Planting date: 10-04-10**
Soil type: Pond Creek silt loam | **Soil test: pH = 5.6, P = 49, K = 477** | **Harvest date: 06-09-11**
Previous crop: Wheat | **Fungicide = 5 oz/A Absolute on 12 April 2011**

		Grain Yield									Test Weight		
		2010-11			2-Year			3-Year			2010-11		
Source	Variety	No Fungicide	Fungicide	*Diff.*	No Fungicide	Fungicide	*Diff.*	No Fungicide	Fungicide	*Diff.*	No Fungicide	Fungicide	*Diff.*
		bu/ac									lb/bu		
OSU	Duster	53	52	-1	42	46	4	47	53	6	60.4	61.9	1.4
WestBred	Armour	45	50	5	36	41	5	44	50	6	59.7	60.6	0.9
KSU	Everest	48	50	2	42	44	2	-	-	-	61.3	60.8	-0.4
TAMU	TAM 203	49	49	0	34	35	2	41	45	3	59.9	60.4	0.5
WestBred	WB-Cedar	44	49	5	-	-	-	-	-	-	59.9	60.7	0.8
OSU	Endurance	46	48	2	38	44	6	46	52	6	61.1	60.8	-0.3
OSU	Billings	46	47	1	39	41	2	42	45	2	61.8	61.2	-0.6
OSU	Garrison	44	47	3	38	42	4	-	-	z	62.5	60.7	-1.8
OSU	OK Bullet	44	47	3	33	38	5	38	44	7	62.3	61.1	-1.3
KSU	Fuller	46	46	0	35	36	1	40	43	3	61.3	61.4	0.1
KSU	Jagger	48	46	-2	34	36	3	39	43	3	60.3	60.6	0.3
WestBred	Santa Fe	47	45	-2	36	37	1	46	45	-1	61.2	61.7	0.5
AgriPro	Doans	43	43	0	31	31	0	37	40	3	63.1	62.3	-0.8
WestBred	WB-Stout	49	43	-6	-	-	-	-	-	-	59.0	59.0	0.0
AgriPro	Greer	43	42	-1	35	38	3	-	-	-	58.9	58.5	-0.4
TAMU	TAM 401	41	42	1	31	32	0	-	-	-	59.0	58.9	-0.1
KSU	Overley	43	41	-2	33	33	1	37	40	3	60.7	61.4	0.7
OSU	Pete	40	39	-1	29	30	1	34	37	3	60.7	58.3	-2.4
AgriPro	Jackpot	41	38	-3	34	33	0	39	39	0	60.6	60.4	-0.2
WestBred	Shocker	39	38	-1	29	31	2	36	38	3	61.2	60.7	-0.5
OSU	Centerfield	42	36	-6	36	32	-4	42	40	-2	60.8	61.3	0.5
OSU	Deliver	32	29	-3	26	26	0	34	37	2	61.9	61.5	-0.4
Experimentals													
	OK07209	52	52	0	-	-	-	-	-	-	63.2	62.7	-0.5
	OK07214	51	52	1	-	-	-	-	-	-	62.3	61.3	-1.1
	OK07231	45	42	-3	38	38	0	-	-	-	60.8	60.7	-0.1
	Mean	45	45	0	35	36	2	40	43	3	61.0	60.8	-0.2
	LSD $_{(0.05)}$	8			4			3			1.8		

Notes: 2010-11 grain yield affected by severe, season-long drought.
Negative responses to fungicide application are statistically nonsignificant and should be regarded as no response

Partial financial support provided by the Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation

Lamont Wheat Variety Trial

Cooperator: Kirby Farms
Soil type: Pond Creek silt loam
Planting date: 10-13-10
Harvest date: 06-10-11

Tillage: Conventional till
Management: Grain only
Previous crop: Wheat
Soil test: pH = 6.3, P = 45, K = 525

		Grain Yield			Test Weight
Source	Variety	2010-11	2-Year	3-Year	2010-11
		----------bu/ac----------			-----lb/bu-----
KSU	Overley	48	45	44	60.4
OSU	Duster	47	46	43	60.7
OSU	Endurance	46	47	46	58.9
KSU	Everest	46	51	-	60.1
WestBred	Shocker	46	43	45	59.0
AgriPro	Greer	44	43	-	56.3
WestBred	Santa Fe	44	41	44	59.8
TAMU	TAM 401	44	44	-	57.6
WestBred	Armour	43	46	43	58.8
TAMU	TAM 203	43	41	43	57.7
KSU	Fuller	41	42	41	59.3
OSU	Garrison	40	44	-	59.6
OSU	OK Bullet	40	38	38	60.8
OSU	Centerfield	39	40	42	59.4
AgriPro	Jackpot	39	44	42	59.3
WestBred	WB-Cedar	39	-	-	59.6
WestBred	WB-Stout	38	-	-	57.0
OSU	Deliver	37	39	40	60.2
AgriPro	Doans	37	41	42	60.6
OSU	Billings	36	42	40	59.8
KSU	Jagger	36	37	39	58.3
	Mean	42	43	42	59.2
	LSD $_{(0.05)}$	8	5	4	1

Notes: 2010-11 grain yield affected by season-long drought.

Partial financial support provided by the Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation

Marshall Dual Purpose Wheat Variety Trial

Cooperator: Fuxa Farms | **Tillage: Conventional till**
Soil type: Kirkland silt loam | **Management: Dual purpose**
Planting date: 09-14-10 | **Previous crop: Wheat**
Harvest date: 06-02-11 | **Soil test: pH = 4.7, P = 100, K = 375**

		Grain Yield*	Leaf Area**		Grain Yield		Test Weight
Source	Variety	2010-11	12/10/10	2/18/11	2-Year	3-Year	2010-11
		--bu/ac--			----------bu/ac----------		-----lb/bu-----
OSU	Endurance	24	*65%*	*58%*	39	27	58.8
KSU	Everest	24	*58%*	*48%*	-	-	58.4
TAMU	TAM 203	24	*75%*	*73%*	34	26	57.1
WestBred	WB-Cedar	24	*70%*	*65%*	-	-	58.9
OSU	Duster	23	*60%*	*48%*	40	31	59.6
AgriPro	Doans	21	*58%*	*58%*	37	29	59.8
KSU	Fuller	20	*80%*	*83%*	34	26	58.1
AgriPro	Greer	20	*75%*	*50%*	30	-	55.8
OSU	Deliver	19	*33%*	*45%*	29	21	60.0
AgriPro	Jackpot	19	*53%*	*50%*	32	23	58.7
KSU	Jagger	19	*80%*	*78%*	29	21	56.7
OSU	Centerfield	16	*15%*	*23%*	33	24	58.1
OSU	OK Bullet	15	*30%*	*48%*	29	22	58.9
WestBred	Santa Fe	15	*70%*	*80%*	31	23	58.3
OSU	Billings	14	*38%*	*38%*	29	21	58.3
KSU	Overley	14	*33%*	*35%*	27	19	59.0
OSU	Pete	14	*55%*	*38%*	31	22	59.7
TAMU	TAM 401	14	*73%*	*53%*	28	-	56.9
WestBred	WB-Stout	14	*53%*	*63%*	-	-	56.8
WestBred	Armour	13	*45%*	*43%*	-	-	57.6
OSU	Garrison	13	*40%*	*45%*	24	-	57.8
WestBred	Shocker	13	*18%*	*15%*	33	26	57.7
Experimentals							
	OK07209	22	*63%*	*53%*	-	-	60.2
	Mean	18	*54%*	*51%*	32	24	58.3
	LSD $_{(0.05)}$	4	*17%*	*6%*	4	3	0.7

Notes: *A hail storm on 23 May 2011 caused severe lodging and shattering. Yield losses were estimated to be 40 - 60%. Additionally, the 2010-11 grain yield was affected by severe, season-long drought.

** Leaf area values are visual estimations of percent ground cover and are representative of preferential grazing by cattle as well as forage growth and recovery

Partial financial support provided by the Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation

Marshall Grain Only Wheat Variety Trial

Cooperator: Fuxa Farms
Tillage: Conventional till
Soil type: Kirkland silt loam
Management: Grain only
Planting date: 10-20-10
Previous crop: Wheat
Harvest date: 06-02-11
Soil test: pH = 4.7, P = 100, K = 375

		Grain Yield*	Grain Yield		Test Weight
Source	Variety	2010-11	2-Year	3-Year	2010-11
		bu/ac			lb/bu
WestBred	Armour	33	-	-	59.5
OSU	Duster	32	39	36	60.5
KSU	Fuller	32	35	30	60.0
AgriPro	Jackpot	32	36	29	60.0
KSU	Jagger	32	29	23	58.2
OSU	Centerfield	31	33	30	57.7
KSU	Overley	31	32	25	60.1
OSU	Endurance	30	35	33	59.7
KSU	Everest	30	-	-	60.3
OSU	Garrison	30	36	-	59.8
AgriPro	Greer	30	32	-	56.8
TAMU	TAM 401	30	35	-	57.3
OSU	Billings	29	34	28	59.4
OSU	Pete	29	32	26	60.7
WestBred	WB-Cedar	29	-	-	59.2
AgriPro	Doans	27	31	30	60.3
WestBred	Shocker	27	33	28	58.2
OSU	Deliver	26	29	26	60.1
OSU	OK Bullet	26	29	25	59.8
WestBred	Santa Fe	26	31	29	59.9
WestBred	WB-Stout	26	-	-	56.9
TAMU	TAM 203	24	27	28	57.1
	Mean	29	33	28	59.2
	LSD $_{(0.05)}$	5	3	3	0.7

Notes: *A hail storm on 23 May 2011 caused severe lodging and shattering. Yield losses were estimated to be 40 - 60%. Additionally, the 2010-11 grain yield was affected by severe, season-long drought.

Marshall Grain Only vs. Dual Purpose Comparison

Cooperator: Fuxa Farms **Tillage: Conventional Till** **Previous crop: Wheat** **Soil type: Kirkland silt loam**
Planting date: 09-14-10 (Dual Purpose) & 10-20-10 (Grain Only) **Harvest date: 06-02-11** **Soil test: pH = 4.7, P = 100, K = 375**

		Grain Yield*									Test Weight		
		2010 - 2011			2-Year			3-Year			2010 - 2011		
Source	Variety	Grain Only	Dual Purpose	***Diff.***	Grain Only	Dual Purpose	***Diff.***	Grain Only	Dual Purpose	***Diff.***	Grain Only	Dual Purpose	***Diff.***
		bu/ac									lb/bu		
OSU	Endurance	30	24	*-6*	35	39	*4*	33	27	*-6*	59.7	58.8	*-0.9*
KSU	Everest	30	24	*-6*	-	-	-	-	-	-	60.3	58.4	*-1.9*
TAMU	TAM 203	24	24	*0*	27	34	*7*	28	26	*-2*	57.1	57.1	*0.0*
WestBred	WB-Cedar	29	24	*-5*	-	-	-	-	-	-	59.2	58.9	*-0.3*
OSU	Duster	32	23	*-9*	39	40	*1*	36	31	*-5*	60.5	59.6	*-0.9*
AgriPro	Doans	27	21	*-6*	31	37	*6*	30	29	*-1*	60.3	59.8	*-0.5*
KSU	Fuller	32	20	*-12*	35	34	*-1*	30	26	*-4*	60.0	58.1	*-1.8*
AgriPro	Greer	30	20	*-10*	32	30	*-2*	-	-	-	56.8	55.8	*-1.0*
OSU	Deliver	26	19	*-7*	29	29	*0*	26	21	*-5*	60.1	60.0	*-0.2*
AgriPro	Jackpot	32	19	*-13*	36	32	*-4*	29	23	*-6*	60.0	58.7	*-1.3*
KSU	Jagger	32	19	*-13*	29	29	*0*	23	21	*-2*	58.2	56.7	*-1.5*
OSU	Centerfield	31	16	*-15*	33	33	*0*	30	24	*-6*	57.7	58.1	*0.4*
OSU	OK Bullet	26	15	*-11*	29	29	*0*	25	22	*-3*	59.8	58.9	*-0.9*
WestBred	Santa Fe	26	15	*-11*	31	31	*0*	29	23	*-6*	59.9	58.3	*-1.6*
OSU	Billings	29	14	*-15*	34	29	*-5*	28	21	*-7*	59.4	58.3	*-1.0*
KSU	Overley	31	14	*-17*	32	27	*-5*	25	19	*-6*	60.1	59.0	*-1.1*
OSU	Pete	29	14	*-15*	32	31	*-1*	26	22	*-4*	60.7	59.7	*-1.0*
TAMU	TAM 401	30	14	*-16*	35	28	*-7*	-	-	-	57.3	56.9	*-0.5*
WestBred	WB-Stout	26	14	*-12*	-	-	-	-	-	-	56.9	56.8	*-0.1*
WestBred	Armour	33	13	*-20*	-	-	-	-	-	-	59.5	57.6	*-1.8*
OSU	Garrison	30	13	*-17*	36	24	*-12*	-	-	-	59.8	57.8	*-1.9*
WestBred	Shocker	27	13	*-14*	33	33	*0*	28	26	*-2*	58.2	57.7	*-0.5*
	Mean	29	18	*-11*	33	32	*-1*	28	24	*-4*	59.2	58.2	*-0.9*
	LSD $_{(0.05)}$		5			4			3			0.7	

Notes: *A hail storm on 23 May 2011 caused severe lodging and shattering. Yield losses were estimated to be 40 - 60%. Additionally, the 2010-11 grain yield was affected by severe, season-long drought.

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McLoud Wheat Variety Trial

Cooperator: Gerod McKinley **Tillage: Conventional till**
Soil type: Keokuk silt loam **Management: Grain only**
Planting date: 10-26-10 **Previous crop: Corn**
Harvest date: 06-13-11 **Soil test: pH = 5.4, P = 57, K = 244**
Fungicide: 14 oz/A Quilt at approx. 10% head emergence

Source	Variety	Grain Yield 2010-11	Test Weight 2010-11
		--bu/ac--	--lb/bu--
OSU	Ruby Lee	53	62.0
AgriPro	Greer	52	60.8
WestBred	Shocker	52	61.3
OSU	Duster	52	62.1
WestBred	WB-Cedar	49	61.2
OSU	2174	48	60.5
TAMU	TAM 203	48	58.2
KSU	Everest	48	62.5
KSU	Overley	47	62.7
WestBred	Armour	47	61.9
OSU	Endurance	47	60.5
OSU	Centerfield	47	59.8
WestBred	WB-Stout	46	59.5
OSU	Billings	46	61.8
AgriPro	Jackpot	46	61.0
KSU	Fuller	45	62.1
WestBred	Santa Fe	42	60.2
KSU	Jagger	42	59.9
AgriPro	Doans	42	62.8
OSU	OK Bullet	41	61.4
Experimentals			
	OK07214	56	62.3
	OK07209	54	62.6
	OK06336	50	59.5
	Mean	48	61.1
	LSD $_{(0.05)}$	5	1.7

Notes: 2010-11 grain yield affected by season-long drought.

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Olustee Wheat Variety Trial

Cooperator: David Bush | **Tillage: Conventional till**
Soil type: Tillman silt loam | **Management: Grain only**
Planting date: dusted in 10-15-10; rain occurred 10-22-10 | **Previous crop: Wheat**
Harvest date: 05-26-11 | **Soil test: pH = 7.9, P = 13, K = 874**

		Grain Yield			Test Weight
Source	Variety	2010-11	2-Year	3-Year	2010-11
		----------bu/ac----------			-----lb/bu-----
OSU	Duster	20	34	32	61.2
KSU	Overley	20	33	31	60.6
OSU	Centerfield	19	30	28	59.0
AgriPro	Greer	19	32	-	59.2
WestBred	Santa Fe	19	31	30	60.2
TAMU	TAM 203	19	28	27	58.1
OSU	Endurance	18	30	28	60.8
KSU	Fuller	18	33	30	59.4
AgriPro	Jackpot	18	30	28	60.1
KSU	Jagger	17	28	27	59.2
OSU	OK Bullet	17	30	30	59.4
OSU	Pete	17	31	28	61.2
WestBred	Armour	16	-	-	59.8
AgriPro	Doans	16	32	29	60.7
KSU	Everest	15	-	-	60.3
TAMU	TAM 401	15	29	-	56.8
OSU	Garrison	12	-	-	59.2
OSU	Billings	11	-	-	58.9
AgriPro	Fannin	11	25	23	60.0
WestBred	WB-Stout	11	-	-	56.4
Experimentals					
	OK07214	14	-	-	60.6
	Mean	16	30	28	59.5
	LSD $_{(0.05)}$	1	2	2	0.4

Notes: 2010-11 grain yield affected by severe, season-long drought.

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Plant height at harvest for selected variety trials in Oklahoma in 2011

Variety	Afton	Alva	Apache	Balko	Buffalo	Cherokee	El Reno	Elk City	Frederick	Gage	Goodwell Irr	Homestead	Hooker	Keyes	Kildare	Lahoma	Lamont	Marshall DP	Marshall GO	McLoud	Olustee
	inches																				
2174	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22	-
Armour	33	24	17	21	17	22	17	20	19	15	23	23	17	20	14	26	24	17	19	20	16
Aspen	-	-	-	-	-	-	-	-	-	-	23	-	-	-	-	-	-	-	-	-	-
Bill Brown	-	-	-	20	-	-	-	-	-	-	23	-	20	19	-	-	-	-	-	-	-
Billings	34	25	19	22	17	21	22	20	16	17	24	24	21	21	19	30	27	15	19	22	16
Centerfield	31	23	-	-	17	25	19	24	20	18	-	26	-	-	15	32	27	18	23	22	18
Deliver	-	20	-	-	-	25	19	-	-	17	-	26	-	-	-	30	26	19	17	-	-
Doans	31	23	19	22	17	24	21	20	18	17	23	25	20	19	18	30	25	19	17	23	18
Duster	33	25	17	22	17	26	23	22	20	16	23	26	20	19	17	30	28	17	19	23	18
Endurance	35	24	21	22	17	26	19	20	18	17	9	25	21	20	18	33	28	17	20	21	18
Everest	33	-	18	-	-	23	17	-	18	-	24	24	-	-	20	28	26	20	21	22	18
Fannin	-	-	21	-	-	-	18	20	20	-	-	-	-	-	-	-	-	-	-	-	17
Fuller	34	26	19	23	21	26	21	23	20	17	22	24	21	20	17	32	28	22	22	24	18
Garrison	-	20	19	21	18	26	21	23	17	-	-	28	-	-	20	30	30	15	20	-	17
Greer	33	25	19	22	18	28	21	21	20	15	23	26	-	-	23	32	26	18	21	23	19
Guymon	-	-	-	-	-	-	-	-	-	-	23	-	-	-	-	-	-	-	-	-	-
Hatcher	-	-	-	18	-	-	-	-	-	-	24	-	19	18	-	-	-	-	-	-	-
Jackpot	36	26	17	21	16	22	20	19	20	18	21	27	20	20	19	30	27	22	21	24	17
Jagger	35	24	18	23	17	26	22	21	21	18	23	25	20	21	19	31	29	21	22	22	19
Mace	-	-	-	19	-	-	-	-	-	-	23	-	17	18	-	-	-	-	-	-	-
OK Bullet	39	26	18	21	16	26	21	20	19	19	24	27	22	21	17	35	30	19	21	23	20
OK Rising	-	-	-	-	-	-	-	-	-	-	24	-	-	-	-	-	-	-	-	-	-
Overley	36	27	-	-	-	26	20	-	22	-	-	27	-	-	19	33	30	19	22	24	20
Pete	-	-	17	-	-	-	18	20	19	-	-	-	-	-	-	29	-	19	18	-	18
Ruby Lee	-	-	-	-	-	-	20	-	20	-	-	-	-	-	19	-	-	-	-	25	-
Santa Fe	33	24	18	21	15	22	19	20	18	16	22	24	-	-	16	33	30	18	19	23	18
Shocker	30	-	-	-	-	25	18	-	-	-	-	24	-	-	20	30	26	18	19	23	-
T158	-	-	-	20	13	-	-	-	-	-	23	-	18	20	-	-	-	-	-	-	-
TAM 111	-	23	-	22	17	-	-	24	-	17	24	-	21	21	-	-	-	-	-	-	-
TAM 112	-	23	-	22	20	-	-	22	-	15	23	-	21	21	-	-	-	-	-	-	-
TAM 203	32	26	20	-	17	28	22	17	20	14	-	26	-	-	20	33	27	19	17	22	19
TAM 401	-	21	20	-	-	28	21	22	19	14	-	24	-	-	-	28	28	17	19	-	19
WB-Cedar	31	-	-	-	-	23	18	-	-	-	-	23	-	-	17	27	25	19	15	22	-
WB-Stout	35	26	18	20	17	21	18	22	19	11	23	21	21	20	20	31	29	17	20	24	17
Winterhawk	-	-	-	22	19	-	-	-	-	17	23	-	-	-	-	-	-	-	-	-	-
OK05312	-	-	-	21	18	-	-	-	-	-	-	-	20	20	-	-	-	-	-	-	-
OK05511-RHf2	-	-	-	-	-	-	-	20	19	-	-	-	-	-	-	-	-	-	-	-	-
OK06336	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22	-	-	-	-	24	-
OK07209	33	22	17	-	-	28	21	22	18	-	-	-	-	-	18	30	-	20	-	22	-
OK07214	33	22	19	-	-	27	-	-	-	-	25	-	-	-	-	31	-	-	-	24	19
OK07231	-	-	-	-	-	-	17	-	-	-	-	27	-	-	16	32	-	-	-	-	-
OK07S117	-	-	-	-	-	-	18	-	-	-	-	-	-	-	-	-	-	19	-	-	-
OK08328	-	-	17	-	-	-	-	-	19	-	-	-	-	-	-	-	-	-	-	-	-

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Current Report

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Fall forage production and date of first hollow stem in winter wheat varieties during the 2010-2011 crop year

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Introduction

Fall forage production potential is just one consideration in deciding which wheat variety to plant. Dual-purpose wheat producers, for example, may find varietal characteristics such as grain yield after grazing and disease resistance to be a more important selection criteria than slight advantages in forage production potential. Forage-only producers might place more importance on planting an awnless wheat variety or one that germinates readily in hot soil conditions. Ultimately, fall forage production is generally not the most important selection criteria used by Oklahoma wheat growers, but it is one that should be considered.

Fall forage production by winter wheat is determined by genetic potential, management, and environmental factors. The purpose of this publication is to quantify some of the genetic differences in forage production potential and grazing duration among the most popular wheat varieties grown in Oklahoma. Management factors such as planting date, seeding rate, and soil fertility are very influential, and are frequently more important than variety in determining forage production. Environmental factors such as rainfall and temperature also play a heavy role in dictating how much fall forage is produced. All of these factors along with yield potential after grazing and the individual producer's preferences will determine which wheat variety is best suited for a particular field.

Site Descriptions and Methods

The objective of the fall forage variety trials is to give producers an indication of the fall forage production ability of wheat varieties commonly grown throughout the state of Oklahoma. The forage trials are conducted under the umbrella of the Oklahoma State University Small Grains Variety Performance Tests at our El Reno and Stillwater, OK test sites. Weather data for these two sites are provided in Figure 1.

A randomized complete block design with four replications was used at each site. Forage was measured by hand clipping two 1-m by 1-row samples at random sites within each plot. Samples were then placed in a forced-air dryer for approximately seven days and weighed. All plots were sown at 120 lb/A in a conventionally-tilled seedbed and received 50 lb/ac of 18-46-0 in furrow at planting. Fertility, planting date, and harvest date information are provided in Table 1.

Results

The 2010-2011 wheat production season will undoubtedly go down as one of the driest, if not the driest, in Oklahoma history. While many areas of the state never received sufficient rainfall for uniform wheat germination, our two test sites received a timely rainfall in September which allowed for uniform germination and emergence of test plots (Figure 1). This was followed by two very timely one-inch plus rainfall events in October and November that allowed for ample forage

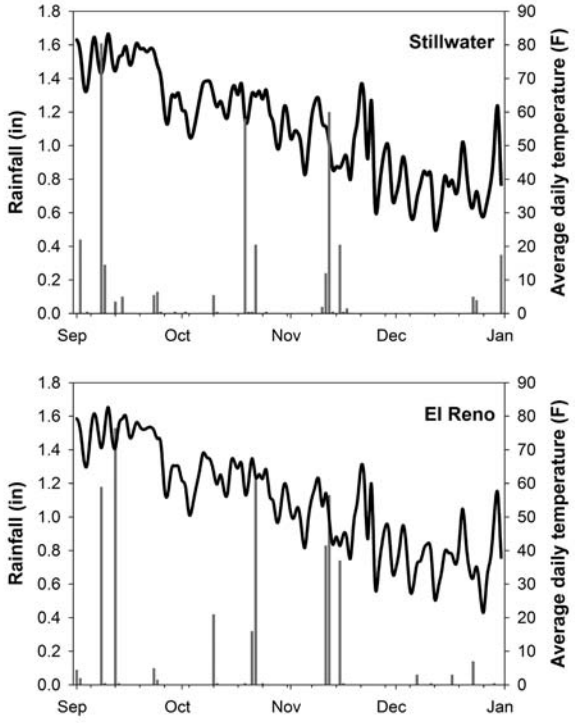

Figure 1. Average daily temperature (line graph) and rainfall (bar chart) from Sept. 1, 2010 to Dec. 31, 2010 at Stillwater and El Reno, OK. Weather data courtesy Oklahoma Mesonet (http://agweather.mesonet.org)

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Table 1. Location information for 2010-2011 OSU wheat forage trials.

	Planting date	*Sampling date*	*pH*	*N*	*P*	*K*
Stillwater	9/14/2010	12/1/2010	5.3	112	144	348
El Reno	9/20/2010	12/3/2010	6.7	82	61	337

Table 2. Fall forage production by winter wheat varieties at Stillwater, OK from 2007 to 2010.

Source	*Variety*	*2010*	*2-Year*	*3-Year*	*4-Year*
		----------lbs dry forage/acre----------			
CSU	Bill Brown	3,180†	-	-	-
WestBred	Armour	3,040	2,740	-	-
OSU	Billings	2,970	2,710	-	-
CSU	Hatcher	2,930	-	-	-
OSU	Ruby Lee	2,930	2,730	-	-
TAMU	TAM 112	2,930	2,640	2,850	-
AgriPro	Greer	2,880	2,510	-	-
AgriPro	Fannin	2,870	2,820	3,060	2,810
WestBred	Winterhawk	2,870	2,500	2,650	-
OSU	Pete	2,860	2,590	-	-
WestBred	WB-Stout	2,850	-	-	-
AgriPro	Doans	2,830	2,650	2,840	2,600
OSU	Endurance	2,830	2,640	2,750	2,520
OSU	Duster	2,820	2,820	3,090	2,890
LCS	T158	2,810	-	-	-
OSU	Centerfield	2,790	2,530	2,800	2,710
AgriPro	Jackpot	2,750	2,630	2,880	2,650
KSU	Overley	2,740	2,650	2,900	2,660
OSU	Garrison	2,710	2,280	-	-
OSU	OK Bullet	2,710	2,710	2,920	2,730
WestBred	Santa Fe	2,710	2,650	2,820	2,510
TAMU	TAM 111	2,700	2,490	2,780	2,600
KSU	Fuller	2,690	2,560	2,800	2,570
WestBred	WB-Cedar	2,690	-	-	-
TAMU	TAM 401	2,670	2,620	-	-
OSU	Deliver	2,660	2,510	2,680	2,510
TAMU	TAM 203	2,620	2,730	2,810	2,550
UNL	Mace	2,590	-	-	-
WestBred	Shocker	2,530	2,530	2,900	2,650
KSU	Everest	2,410	2,200	-	-
KSU	Jagger	2,390	2,350	2,660	2,310
Experimentals					
	OK07209	3,120	-	-	-
	OK07231	3,100	2,790	-	-
	OK07S117	2,740	-	-	-
Average		**2,790**	**2,600**	**2,830**	**2,620**
LSD(0.05)		560	330	270	220

† Shaded numbers are not statistically different from the highest-yielding variety within a column.

Table 3. Fall forage production by winter wheat varieties at El Reno, OK in 2007, 2008, and 2010.

Source	Variety	2010	2-Year†	3-Year
		----------lbs. dry forage/acre----------		
AgriPro	Fannin	4,160‡	2,800	2,870
OSU	OK Bullet	4,020	2,850	2,690
WestBred	Armour	3,790	2,720	-
OSU	Billings	3,750	-	-
AgriPro	Greer	3,730	-	-
WestBred	WB-Stout	3,670	-	-
OSU	Duster	3,640	2,670	2,700
OSU	Centerfield	3,590	2,600	2,360
KSU	Overley	3,590	2,720	2,480
TAMU	TAM 401	3,520	-	-
KSU	Everest	3,510	-	-
WestBred	Shocker	3,490	2,490	2,400
TAMU	TAM 203	3,490	2,450	-
OSU	Deliver	3,440	2,500	2,600
AgriPro	Jackpot	3,440	2,480	2,600
WestBred	Santa Fe	3,310	2,370	2,460
WestBred	WB-Cedar	3,300	-	-
OSU	Garrison	3,250	-	-
KSU	Fuller	3,220	2,510	2,380
OSU	Pete	3,180	-	-
AgriPro	Doans	3,110	2,470	2,580
OSU	Endurance	3,030	2,270	2,450
KSU	Jagger	2,900	2,150	2,090
Experimentals				
	OK07S117	3,850	-	-
Average		**3,500**	**2,540**	**2,510**
LSD(0.05)		810	500	380

† Data were not reported in 2009. 2-year averages include 2008 and 2010 data. 3-year averages include 2007, 2008, and 2010 data.
‡ Shaded cells within a column are not statistically different from the greatest value within that column

production. This was not the case in many areas of Oklahoma where early-season drought prevented fall forage production from reaching the 1,000 lb/ac mark.

Forage yields at both sites were outstanding in 2010, and all varieties produced greater than 2,000 lb/ac of forage by early December (Tables 2 and 3). There were a large number of varieties in the top statistical grouping for forage yield (i.e. all varieties within this group produced statistically-equivalent forage yield) at both sites. In fact, only four cultivars (Mace, Shocker, Everest, and Jagger) fell outside of the top statistical grouping for forage yield in 2010 at Stillwater. The top grouping at El Reno included more than 50 percent of the cultivars tested. A similar trend was observed for the two-year forage averages at both sites with most varieties producing statistically-equal forage yields by early December.

There is greater separation among varieties when three- and four-year forage yields are considered and some consistent top performers such as Fannin, Duster, and OK Bullet can be identified. This is not to say that some of the newer varieties cannot produce forage yields equal to or greater than these three varieties, and rankings could change as we have more data on newer varieties. Three- and four-year variety comparisons, however, are extremely valuable in evaluating the stability of forage production over a range of environments.

As mentioned in the introduction, fall forage production is only one parameter to be considered when choosing a dual-purpose wheat variety. Date of first hollow stem, for example, will determine how long fall forage production can be utilized into the spring and should be considered in conjunction with fall forage production. Varieties such as TAM 401 and Fannin are outstanding forage producers but also have very early date of first hollow stem. Varieties such as Doans and Endurance are not consistently as good of forage producers as TAM 401 and Fannin but are above-average forage producers and much later to first hollow stem. Dual-purpose producers should consider these two parameters in conjunction with grain yield after grazing before making a variety choice.

First hollow stem data are reported in 'day of year' (day) format. To provide reference, keep in mind that March 1 is day 60 (except for leap years). Average occurrence of first hollow stem at Stillwater and El Reno in 2011 was day 63 and 64, respectively. This was approximately one week earlier than average occurrence of first hollow stem in 2010, and was probably a result of warmer temperatures combined with drought stress. There was a 29-day range in occurrence of first hollow stem at Stillwater and a 24-day range at El Reno. Environment plays a role in occurrence of first hollow stem,

Table 4. Occurrence of first hollow stem (day of year) for winter wheat varieties sown in 2010 and measured in 2011 at Stillwater and El Reno, OK.

		Stillwater	El Reno
		----day of year ----	
AgriPro	Fannin	48	60
KSU	Jagger	49	65
KSU	Everest	52	62
AgriPro	Greer	52	52
OSU	Billings	55	60
KSU	Fuller	55	57
OSU	Guymon	55	-
AgriPro	Jackpot	55	62
KSU	Overley	55	62
TAMU	TAM 401	55	60
OSU	Garrison	58	69
TAMU	TAM 112	58	-
CSU	Bill Brown	60	-
WestBred	Santa Fe	60	65
TAMU	TAM 203	60	62
WestBred	WB-Stout	60	67
OSU	OK Bullet	62	67
OSU	Ruby Lee	62	-
WestBred	Shocker	62	60
LCS	T158	62	-
OSU	OK Rising	65	-
OSU	Duster	67	69
WestBred	Armour	68	65
CSU	Hatcher	68	-
OSU	Pete	68	65
WestBred	WB-Cedar	68	65
WestBred	Winterhawk	68	-
WestBred	Aspen	70	-
OSU	Centerfield	70	72
OSU	Deliver	70	69
AgriPro	Doans	70	65
TAMU	TAM 111	72	-
OSU	Endurance	73	76
OSU	2174	77	-
UNL	Mace	77	-
Experimentals			
	OK07S117	52	54
	OK07214	58	-
	OK05312	60	-
	OK06336	68	-
	OK07209	68	-
	OK07231	68	-
	OK08328	68	-
	OK05511-RHf2	70	-
Average		**63**	**64**

so day of first hollow stem for individual varieties varied slightly between locations, but relative rankings of varieties (i.e. early, medium, or late) were relatively consistent.

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Seed Source Abbreviations
CSU = Colorado State University
KSU = Kansas State University
LCS = Limagrain Cereal Seeds
OSU = Oklahoma State University
UNL = University of Nebraska-Lincoln
TAMU = Texas AgriLife Research

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