



Current Report

Oklahoma Cooperative Extension Fact Sheets are also available on our website at:
osufacts.okstate.edu

Protein Content of Winter Wheat Varieties in Oklahoma—2015

Jeff Edwards
Small Grains Extension Specialist

Robert Calhoun
Senior Agriculturalist

Brett Carver
Wheat Breeder

Romulo Lollato
Graduate Assistant

Giovana Cruppe
Graduate Assistant

General Information

Protein is just one of many attributes which determine end-use quality and marketability of winter wheat. In fact, some millers and bakers would argue that functionality of wheat protein is more important than the quantity of protein. While varietal differences commonly exist, differences in varietal protein among environments are generally much larger than differences among varieties. Factors such as nitrogen fertility and drought stress, for example, can sharply impact final protein content of the grain.

To reflect these environmental impacts on wheat grain protein content, data are reported by variety and location in Table 1. In Table 2 we reported the wheat grain protein content as a deviation from location mean for each variety, as this provides easier comparison of wheat grain protein among varieties across locations. Billings, for example, is a variety with solidly positive deviation from location means, indicating it has a tendency for above-average grain protein content. Iba, on the other hand, has negative deviations from location means, indicating a tendency for lower than average grain protein content. Adequate nitrogen fertility as recommended by a recent soil test or sensor-based nitrogen management program can help ensure that varieties such as Iba produce grain protein within the acceptable range for end-use customers. Iba is also a prime example of how protein data can sometimes be misused, as the functionality of the protein in Iba is above average, which can offset lower absolute grain protein content.

Procedures

Approximately 600g subsamples of wheat grain were collected from the OSU wheat variety performance test plots at harvest. These plots were well-fertilized and managed according to Oklahoma Cooperative Extension Services recommendations. Additional information on test locations and management practices is available in Current Report 2143,

“2015 Oklahoma Small Grains Variety Performance Tests” on the web at www.wheat.okstate.edu. Samples were stored in plastic containers for approximately three months following harvest. Samples were nondestructively analyzed for protein content using a Diode Array Near Infrared instrument (NIR) (model DA 7200, Perten Instruments, Sweden).

Funding provided by:

Oklahoma Wheat Commission
Oklahoma Wheat Research Foundation
Oklahoma Cooperative Extension Service
Oklahoma Agricultural Experiment Station
Entry fees from participating seed companies

We sincerely thank our variety trial cooperators for donation of land, time and resources. Variety trial cooperators include:

Afton – Greg Leonard
Altus – Southwest Research and Extension Center
Alva – Wes Mallory
Apache – Bryan Vail
Balko – Kenton Patzkowski
Buffalo – NRCS
Cherokee – Kenneth Failles
Chickasha – South Central Research Station
Goodwell – Oklahoma Panhandle Research
and Extension Center
Homestead – Brook Strader
Hooker – Dan and Earnest Herald
Keyes – J.B. Stewart
Kildare – Don Schieber
Kingfisher – Rodney Mueggenborg
Lahoma – North Central Research Station
Lamont – Kirby Farms
Marshall – Fuxa Farms
McLoud – Gerod McKinley
Thomas – Brownie Browne
Union City – Don Bornemann
Walters – Kinder Farms

Table 1. Wheat protein content of varieties and experimental lines tested in the 2015 Oklahoma Wheat Variety Performance Tests.

Source	Variety	----- %wheat protein (12% moisture basis) -----									
		Afton	Altus	Alva	Apache	Apache Fungicide	Balko	Buffalo	Cherokee	Chickasha	Chickasha IWM
KWA	1863	-	12.4	-	-	-	-	-	-	11.4	12.4
OGI	Bentley	10.8	12.7	11.6	12.7	13.3	-	12.1	12.0	11.4	12.8
OGI	Billings	11.6	14.8	13.7	-	-	-	13.4	13.0	12.8	13.4
PlainsGold	Brawl CL Plus	-	14.2	12.7	14.2	14.4	10.5	12.3	12.4	13.4	13.6
PlainsGold	Byrd	-	12.9	11.2	13.1	13.6	9.3	10.9	11.3	12.0	13.1
OGI	Centerfield	-	14.7	-	-	-	-	-	-	13.2	13.9
OGI	Deliver	-	13.2	-	-	-	-	-	-	11.8	12.5
OGI	Doublestop CL Plus	11.2	13.2	12.8	13.4	14.1	10.4	12.4	11.8	12.9	13.7
OGI	Duster	10.8	13.1	13.0	14.7	14.4	9.6	12.3	12.7	13.1	13.6
OSU	Endurance	10.7	13.8	12.3	13.9	13.9	9.7	11.6	11.9	12.3	12.8
KWA	Everest	10.5	13.9	-	13.1	14.1	-	-	-	12.4	13.2
OGI	Gallagher	10.6	13.4	12.8	13.3	13.5	9.2	13.0	12.3	12.1	12.4
OGI	Garrison	10.6	12.4	12.2	12.4	13.0	10.3	12.0	11.6	11.7	12.3
Syngenta	Greer	10.3	12.9	12.3	12.8	13.4	10.0	12.4	12.3	12.3	12.8
KWA	Hot Rod	-	14.5	-	-	-	-	-	-	12.1	12.8
OGI	Iba	11.0	12.5	11.9	12.4	12.3	9.5	11.6	11.2	11.6	11.8
Syngenta	Jackpot	-	12.0	13.0	12.4	13.4	10.3	11.7	11.4	11.5	12.0
KWA	KanMark	-	13.9	12.8	-	-	9.3	12.3	13.0	12.6	12.9
LCS	LCS Mint	-	12.2	11.2	-	-	8.9	11.3	10.9	11.6	11.8
LCS	LCS Pistol	11.7	13.8	13.0	13.8	13.4	9.7	12.0	11.4	13.0	13.5
LCS	LCS Wizard	11.7	14.8	-	-	-	-	-	-	12.6	13.4
OGI	NF 101	-	13.2	-	-	-	-	-	-	12.2	13.0
KWA	Oakley CL	-	14.0	-	-	-	-	-	-	13.2	14.4
OGI	OK Rising	-	13.8	-	-	-	-	-	-	12.9	13.9
OGI	Pete	-	12.6	-	-	-	-	-	-	11.4	11.7
OGI	Ruby Lee	11.0	14.8	12.9	12.6	13.6	10.5	12.8	12.5	12.1	13.1
Syngenta	SY Drifter	-	13.7	-	-	-	-	-	-	12.7	12.8
Syngenta	SY Flint	-	14.1	-	-	-	-	-	-	12.1	12.9
Syngenta	SY Llano	-	13.4	-	13.5	13.4	-	-	-	12.1	12.2
Syngenta	SY Monument	-	13.3	-	-	-	-	-	-	12.7	12.4
Syngenta	SY Southwind	11.0	13.3	-	-	-	-	-	-	12.2	12.5
LCS	T153	-	14.0	-	13.0	13.0	-	-	-	12.5	12.8
LCS	T154	11.3	14.2	12.8	13.1	13.1	-	12.4	11.5	12.2	12.9
LCS	T158	-	12.9	-	-	-	9.1	-	-	12.0	12.2
Watley	TAM 112	-	12.7	12.8	-	-	10.3	11.9	12.4	12.2	13.0
AGSECO	TAM 113	-	13.9	13.1	-	-	9.9	12.6	11.8	13.1	13.6
AGSECO	TAM 114	-	13.6	12.1	-	-	9.4	11.1	11.9	11.8	11.8
Watley	TAM 204	-	13.9	13.3	-	-	10.0	12.1	12.5	13.2	13.6
WestBred	WB-Cedar	11.0	13.3	13.1	-	-	-	12.7	12.9	12.1	12.6
WestBred	WB-Grainfield	-	12.8	-	12.5	12.6	8.9	-	-	12.1	12.1
WestBred	WB-Redhawk	10.7	13.2	-	-	-	-	-	-	12.1	12.0
WestBred	WB4458	11.2	13.7	13.3	13.4	14.5	11.1	13.3	13.9	11.9	12.9
WestBred	Winterhawk	-	12.9	11.4	12.6	12.9	9.2	11.1	11.8	11.9	12.5
Experimentals											
	CO11D174	-	12.9	-	-	-	-	-	-	11.7	12.7
	LCH13DH-14-91	-	12.8	-	-	-	-	-	-	11.9	13.2
	LCH13DH-20-87	-	13.4	-	-	-	-	-	-	12.9	12.9
	OK08P707W-19C13	-	-	-	-	-	10.2	-	-	-	-
	OK0986130-7C13	-	-	-	-	-	9.1	-	-	-	-
	OK10126	10.9	14.0	-	12.4	12.6	-	-	-	13.1	13.2
	OK1059060-2C14	-	13.2	12.7	-	-	-	-	-	12.1	13.0
	OK10728W	-	-	-	-	-	-	-	-	-	-
	OK11231	11.1	13.9	-	-	-	-	-	-	-	-
	OK11755W	-	-	-	-	-	-	-	-	-	-
	OK11D25056	11.1	13.2	-	13.8	13.3	-	-	11.7	12.6	13.5
	OK12621	-	-	-	-	-	-	-	-	-	-
	OK13625	11.9	-	-	-	-	-	-	-	13.2	13.5
Mean		11.0	13.4	12.6	13.2	13.4	9.8	12.1	12.1	12.3	12.9
LSD (0.05)		0.6	0.8	0.7	0.7	0.8	0.5	0.7	1.0	0.5	0.6

Table 1. Wheat protein content of varieties and experimental lines tested in the 2015 Oklahoma Wheat Variety Performance Tests (cont'd).

Source	Variety	Goodwell						Lahoma			Union	
		Irrigated	Homestead	Hooker	Keyes	Kildare	Kingfisher	Lahoma	Fungicide	McCloud	City	Walters
		----- %wheat protein (12% moisture basis) -----										
KWA	1863	12.5	-	-	-	-	-	10.7	11.2	-	-	-
OGI	Bentley	-	11.6	-	-	11.7	9.2	11.0	11.4	12.5	10.8	10.1
OGI	Billings	14.6	13.8	-	-	14.2	11.2	12.7	12.8	12.7	11.4	-
PlainsGold	Brawl CL Plus	13.7	12.9	14.7	13.9	13.0	11.4	12.7	13.0	13.0	12.4	11.9
PlainsGold	Byrd	13.9	11.6	13.4	11.8	11.9	8.4	11.4	11.3	12.2	11.9	10.0
OGI	Centerfield	13.6	-	-	-	-	-	12.8	12.5	-	-	-
OGI	Deliver	12.3	-	-	-	-	-	11.6	11.6	-	-	-
OGI	Doublestop CL Plus	14.2	12.0	15.3	14.0	12.4	10.6	12.3	12.7	13.1	11.1	10.6
OGI	Duster	13.7	13.5	15.3	13.2	13.4	10.5	12.7	12.5	13.0	11.9	10.4
OSU	Endurance	12.3	12.7	13.7	13.4	13.0	10.1	12.1	12.1	12.5	12.1	11.0
KWA	Everest	12.4	12.5	-	-	12.6	9.9	11.4	12.2	12.1	11.1	11.4
OGI	Gallagher	13.6	12.6	16.0	13.8	13.3	9.4	11.7	11.8	12.2	10.9	10.5
OGI	Garrison	13.5	11.6	13.6	13.0	12.0	9.6	11.9	11.8	12.1	11.9	10.8
Syngenta	Greer	13.7	12.5	16.1	13.2	12.1	9.4	11.7	11.5	12.4	11.5	10.3
KWA	Hot Rod	12.7	-	-	-	-	-	11.7	11.8	-	-	-
OGI	Iba	12.5	11.7	14.0	12.0	11.2	9.8	11.2	11.0	11.6	10.9	10.7
Syngenta	Jackpot	12.4	11.5	14.7	11.5	12.3	9.1	10.5	10.9	11.6	11.3	11.0
KWA	KanMark	13.0	-	14.9	13.3	-	-	12.2	11.7	-	-	-
LCS	LCS Mint	13.2	10.7	13.6	10.8	11.2	-	10.7	11.0	-	-	-
LCS	LCS Pistol	13.2	12.9	15.9	12.3	13.4	9.9	12.5	12.1	13.1	12.1	10.3
LCS	LCS Wizard	13.1	12.9	-	-	12.5	10.1	12.9	12.7	13.0	12.0	-
OGI	NF 101	13.7	-	-	-	-	-	11.3	11.6	-	-	-
KWA	Oakley CL	14.0	-	-	-	-	-	12.5	12.6	-	-	-
OGI	OK Rising	12.8	-	-	-	-	-	12.1	12.1	-	-	-
OGI	Pete	11.4	-	-	-	-	-	10.5	10.6	-	10.3	10.5
OGI	Ruby Lee	13.6	12.3	15.8	13.8	12.6	9.9	12.1	12.5	12.8	11.4	11.2
Syngenta	SY Drifter	13.2	-	-	-	-	-	12.1	12.2	-	-	-
Syngenta	SY Flint	13.5	-	-	-	-	-	12.0	12.2	-	-	-
Syngenta	SY Llano	-	-	-	-	-	10.4	11.8	11.6	12.3	10.5	12.1
Syngenta	SY Monument	13.9	-	-	-	-	-	11.9	12.0	-	-	-
Syngenta	SY Southwind	13.2	12.1	-	-	12.8	-	11.6	11.8	-	-	-
LCS	T153	12.7	-	-	-	-	-	11.9	11.7	-	-	12.1
LCS	T154	13.0	-	-	-	-	9.6	11.9	12.1	12.5	11.0	11.7
LCS	T158	12.9	-	14.5	11.1	-	-	11.2	11.0	-	-	-
Watley	TAM 112	13.9	-	15.0	12.6	-	-	11.7	11.8	-	-	-
AGSECO	TAM 113	13.3	-	15.0	13.4	-	-	13.1	12.4	-	-	-
AGSECO	TAM 114	13.8	-	16.2	13.4	-	-	11.4	11.7	-	-	-
Watley	TAM 204	13.3	-	15.2	13.2	-	-	12.5	11.9	-	12.2	11.0
WestBred	WB-Cedar	13.3	12.3	-	-	12.7	10.8	11.6	11.8	12.1	10.9	-
WestBred	WB-Grainfield	13.0	-	15.0	12.1	-	-	11.0	11.0	-	-	10.3
WestBred	WB-Redhawk	13.1	12.0	-	-	12.3	9.6	11.3	12.3	12.3	10.9	-
WestBred	WB4458	13.1	12.0	16.3	13.5	12.8	10.6	11.4	12.0	12.4	11.1	12.7
WestBred	Winterhawk	13.0	-	13.8	12.0	-	-	11.4	11.6	-	-	9.7
Experimentals												
	CO11D174	13.4	-	-	-	-	-	11.6	11.6	-	-	-
	LCH13DH-14-91	13.4	-	-	-	-	-	11.6	12.0	-	-	-
	LCH13DH-20-87	13.7	-	-	-	-	-	12.1	12.3	-	-	-
	OK08P707W-19C13	12.7	12.5	14.8	13.1	-	-	-	-	-	-	-
	OK0986130-7C13	13.2	-	14.3	11.8	-	-	-	-	-	-	-
	OK10126	12.7	-	-	-	-	-	11.5	11.5	12.7	-	-
	OK1059060-2C14	13.2	-	16.5	-	12.3	10.2	11.7	11.9	-	-	11.8
	OK10728W	-	12.2	-	-	13.1	-	12.0	12.4	-	-	-
	OK11231	-	-	-	-	-	-	11.7	12.3	-	-	11.6
	OK11755W	-	-	-	-	13.0	-	11.9	12.3	-	-	-
	OK11D25056	12.5	12.8	15.6	-	13.3	10.2	12.0	12.0	-	-	10.9
	OK12621	12.9	-	15.9	-	-	-	12.6	12.3	-	-	-
	OK13625	-	-	-	-	12.7	-	12.7	13.1	13.1	-	-
Mean		13.2	12.3	15.0	12.8	12.6	10.0	11.8	11.9	12.5	11.4	11.0
LSD (0.05)		0.6	0.3	1.0	1.8	0.4	0.7	0.4	0.4	0.4	0.9	0.8

Table 2. Wheat protein content relative to the location mean (expressed as a deviation) for varieties tested in the 2015 Oklahoma Wheat Variety Performance Tests.

Source	Variety	%wheat protein (12% moisture basis)									
		Afton	Altus	Alva	Apache	Apache Fungicide	Balko	Buffalo	Cherokee	Chickasha	Chickasha IWM
KWA	1863	-	-1.0	-	-	-	-	-	-	-1.0	-0.5
OGI	Bentley	-0.3	-0.7	-1.0	-0.5	-0.2	-	0.0	0.0	-0.9	0.0
OGI	Billings	0.5	1.3	1.1	-	-	-	1.3	0.9	0.5	0.5
PlainsGold	Brawl CL Plus	-	0.8	0.2	1.1	1.0	0.7	0.2	0.3	1.0	0.7
PlainsGold	Byrd	-	-0.6	-1.3	-0.1	0.2	-0.5	-1.2	-0.8	-0.3	0.2
OGI	Centerfield	-	1.3	-	-	-	-	-	-	0.8	1.0
OGI	Deliver	-	-0.3	-	-	-	-	-	-	-0.5	-0.4
OGI	Doublestop CL Plus	0.2	-0.2	0.2	0.2	0.7	0.6	0.2	-0.3	0.6	0.8
OGI	Duster	-0.3	-0.4	0.5	1.6	0.9	-0.1	0.2	0.6	0.8	0.7
OSU	Endurance	-0.3	0.4	-0.3	0.8	0.5	-0.1	-0.5	-0.2	0.0	0.0
KWA	Everest	-0.5	0.4	-	0.0	0.6	-	-	-	0.0	0.3
OGI	Gallagher	-0.5	0.0	0.3	0.2	0.0	-0.6	0.9	0.2	-0.2	-0.5
OGI	Garrison	-0.4	-1.0	-0.4	-0.7	-0.4	0.5	-0.2	-0.5	-0.6	-0.6
Syngenta	Greer	-0.8	-0.5	-0.2	-0.3	-0.1	0.3	0.3	0.3	-0.1	-0.1
KWA	Hot Rod	-	1.0	-	-	-	-	-	-	-0.2	-0.1
OGI	Iba	-0.1	-1.0	-0.6	-0.7	-1.2	-0.3	-0.5	-0.9	-0.8	-1.1
Syngenta	Jackpot	-	-1.4	0.5	-0.8	-0.1	0.5	-0.4	-0.7	-0.9	-0.9
KWA	KanMark	-	0.4	0.2	-	-	-0.5	0.1	0.9	0.3	0.0
LCS	LCS Mint	-	-1.2	-1.3	-	-	-0.8	-0.8	-1.2	-0.7	-1.1
LCS	LCS Pistol	0.7	0.4	0.4	0.7	0.0	-0.1	-0.2	-0.6	0.6	0.6
LCS	LCS Wizard	0.7	1.3	-	-	-	-	-	-	0.3	0.5
OGI	NF 101	-	-0.2	-	-	-	-	-	-	-0.1	0.2
KWA	Oakley CL	-	0.6	-	-	-	-	-	-	0.9	1.5
OGI	OK Rising	-	0.3	-	-	-	-	-	-	0.6	1.0
OGI	Pete	-	-0.8	-	-	-	-	-	-	-0.9	-1.1
OGI	Ruby Lee	0.0	1.3	0.4	-0.5	0.2	0.8	0.7	0.4	-0.3	0.2
Syngenta	SY Drifter	-	0.3	-	-	-	-	-	-	0.4	-0.1
Syngenta	SY Flint	-	0.6	-	-	-	-	-	-	-0.3	0.0
Syngenta	SY Llano	-	0.0	-	0.3	0.0	-	-	-	-0.2	-0.6
Syngenta	SY Monument	-	-0.1	-	-	-	-	-	-	0.3	-0.5
Syngenta	SY Southwind	0.0	-0.1	-	-	-	-	-	-	-0.1	-0.3
LCS	T153	-	0.6	-	-0.1	-0.4	-	-	-	0.1	0.0
LCS	T154	0.3	0.8	0.2	0.0	-0.3	-	0.3	-0.6	-0.1	0.1
LCS	T158	-	-0.5	-	-	-	-0.7	-	-	-0.3	-0.7
Watley	TAM 112	-	-0.8	0.2	-	-	0.5	-0.3	0.3	-0.1	0.2
AGSECO	TAM 113	-	0.4	0.5	-	-	0.1	0.5	-0.3	0.8	0.7
AGSECO	TAM 114	-	0.1	-0.4	-	-	-0.3	-1.1	-0.2	-0.5	-1.1
Watley	TAM 204	-	0.4	0.7	-	-	0.2	-0.1	0.5	0.9	0.7
WestBred	WB-Cedar	0.0	-0.1	0.6	-	-	-	0.6	0.8	-0.2	-0.2
WestBred	WB-Grainfield	-	-0.7	-	-0.7	-0.9	-0.9	-	-	-0.3	-0.7
WestBred	WB-Redhawk	-0.3	-0.2	-	-	-	-	-	-	-0.2	-0.9
WestBred	WB4458	0.2	0.2	0.7	0.3	1.0	1.4	1.1	1.8	-0.4	0.0
WestBred	Winterhawk	-	-0.5	-1.2	-0.5	-0.6	-0.5	-1.1	-0.3	-0.4	-0.4
Experimentals											
	CO11D174	-	-0.5	-	-	-	-	-	-	-0.6	-0.2
	LCH13DH-14-91	-	-0.6	-	-	-	-	-	-	-0.5	0.3
	LCH13DH-20-87	-	-0.1	-	-	-	-	-	-	0.6	0.0
	OK08P707W-19C13	-	-	-	-	-	0.5	-	-	-	-
	OK0986130-7C13	-	-	-	-	-	-0.6	-	-	-	-
	OK10126	-0.1	0.6	-	-0.7	-0.8	-	-	-	0.8	0.4
	OK1059060-2C14	-	-0.3	0.1	-	-	-	-	-	-0.2	0.1
	OK10728W	-	-	-	-	-	-	-	-	-	-
	OK11231	0.1	0.5	-	-	-	-	-	-	-	-
	OK11755W	-	-	-	-	-	-	-	-	-	-
	OK11D25056	0.0	-0.2	-	0.7	-0.1	-	-	-0.3	0.3	0.7
	OK12621	-	-	-	-	-	-	-	-	-	-
	OK13625	0.8	-	-	-	-	-	-	-	0.9	0.6
Mean		11.0	13.4	12.6	13.2	13.4	9.8	12.1	12.1	12.3	12.9
LSD (0.05)		0.6	0.8	0.7	0.7	0.8	0.5	0.7	1.0	0.5	0.6

Table 2. Wheat protein content relative to the location mean (expressed as a deviation) for varieties tested in the 2015 Oklahoma Wheat Variety Performance Tests (cont'd).

Source	Variety	----- %wheat protein (12% moisture basis) -----										
		Goodwell Irrigated	Homestead	Hooker	Keyes	Kildare	Kingfisher	Lahoma	Lahoma Fungicide	McLoud	Union City	Walters
KWA	1863	-0.6	-	-	-	-	-	-1.1	-0.7	-	-	-
OGI	Bentley	-	-0.7	-	-	-0.9	-0.8	-0.8	-0.5	0.0	-0.6	-0.9
OGI	Billings	1.4	1.5	-	-	1.6	1.2	0.9	0.9	0.2	0.0	-
PlainsGold	Brawl CL Plus	0.5	0.6	-0.4	1.1	0.4	1.4	0.9	1.1	0.6	1.0	0.9
PlainsGold	Byrd	0.7	-0.7	-1.6	-1.0	-0.7	-1.6	-0.4	-0.7	-0.3	0.5	-1.0
OGI	Centerfield	0.4	-	-	-	-	-	1.0	0.6	-	-	-
OGI	Deliver	-0.9	-	-	-	-	-	-0.3	-0.3	-	-	-
OGI	Doublestop CL Plus	1.0	-0.3	0.3	1.2	-0.2	0.6	0.5	0.8	0.6	-0.3	-0.4
OGI	Duster	0.5	1.2	0.3	0.4	0.8	0.5	0.9	0.6	0.5	0.5	-0.6
OSU	Endurance	-0.8	0.4	-1.3	0.7	0.4	0.1	0.2	0.2	0.0	0.7	0.0
KWA	Everest	-0.8	0.2	-	-	0.0	-0.1	-0.4	0.3	-0.4	-0.3	0.4
OGI	Gallagher	0.4	0.3	1.0	1.0	0.7	-0.6	-0.1	-0.1	-0.3	-0.5	-0.5
OGI	Garrison	0.3	-0.7	-1.4	0.2	-0.6	-0.4	0.1	-0.1	-0.4	0.5	-0.2
Syngenta	Greer	0.5	0.2	1.1	0.5	-0.5	-0.6	-0.1	-0.5	-0.1	0.1	-0.7
KWA	Hot Rod	-0.5	-	-	-	-	-	-0.1	-0.1	-	-	-
OGI	Iba	-0.7	-0.6	-1.0	-0.8	-1.4	-0.2	-0.6	-0.9	-0.9	-0.4	-0.3
Syngenta	Jackpot	-0.8	-0.8	-0.4	-1.3	-0.3	-0.9	-1.4	-1.0	-0.9	-0.1	0.0
KWA	KanMark	-0.2	-	-0.1	0.5	-	-	0.4	-0.3	-	-	-
LCS	LCS Mint	0.0	-1.6	-1.4	-1.9	-1.4	-	-1.1	-0.9	-	-	-
LCS	LCS Pistol	0.0	0.6	0.9	-0.4	0.8	-0.1	0.7	0.2	0.6	0.8	-0.7
LCS	LCS Wizard	-0.1	0.6	-	-	-0.1	0.1	1.1	0.7	0.5	0.6	-
OGI	NF 101	0.5	-	-	-	-	-	-0.5	-0.4	-	-	-
KWA	Oakley CL	0.8	-	-	-	-	-	0.6	0.6	-	-	-
OGI	OK Rising	-0.4	-	-	-	-	-	0.2	0.2	-	-	-
OGI	Pete	-1.8	-	-	-	-	-	-1.3	-1.3	-	-1.1	-0.5
OGI	Ruby Lee	0.5	0.0	0.8	1.0	0.0	-0.1	0.2	0.6	0.3	0.0	0.2
Syngenta	SY Drifter	0.1	-	-	-	-	-	0.3	0.3	-	-	-
Syngenta	SY Flint	0.3	-	-	-	-	-	0.2	0.3	-	-	-
Syngenta	SY Llano	-	-	-	-	-	0.4	0.0	-0.3	-0.2	-0.8	1.1
Syngenta	SY Monument	0.7	-	-	-	-	-	0.1	0.1	-	-	-
Syngenta	SY Southwind	0.0	-0.2	-	-	0.2	-	-0.2	-0.1	-	-	-
LCS	T153	-0.5	-	-	-	-	-	0.0	-0.2	-	-	1.1
LCS	T154	-0.1	-	-	-	-	-0.4	0.1	0.2	0.0	-0.4	0.7
LCS	T158	-0.3	-	-0.5	-1.6	-	-	-0.6	-0.9	-	-	-
Watley	TAM 112	0.7	-	0.0	-0.1	-	-	-0.1	-0.1	-	-	-
AGSECO	TAM 113	0.1	-	0.0	0.6	-	-	1.3	0.5	-	-	-
AGSECO	TAM 114	0.6	-	1.2	0.7	-	-	-0.4	-0.2	-	-	-
Watley	TAM 204	0.1	-	0.2	0.4	-	-	0.7	0.0	-	0.9	0.0
WestBred	WB-Cedar	0.1	0.0	-	-	0.1	0.8	-0.2	-0.1	-0.4	-0.5	-
WestBred	WB-Grainfield	-0.1	-	0.0	-0.6	-	-	-0.8	-1.0	-	-	-0.7
WestBred	WB-Redhawk	-0.1	-0.3	-	-	-0.3	-0.4	-0.6	0.4	-0.2	-0.4	-
WestBred	WB4458	-0.1	-0.3	1.3	0.7	0.2	0.6	-0.4	0.1	-0.1	-0.2	1.7
WestBred	Winterhawk	-0.2	-	-1.2	-0.8	-	-	-0.4	-0.4	-	-	-1.3
Experimentals												
	CO11D174	0.2	-	-	-	-	-	-0.2	-0.3	-	-	-
	LCH13DH-14-91	0.2	-	-	-	-	-	-0.2	0.1	-	-	-
	LCH13DH-20-87	0.5	-	-	-	-	-	0.3	0.4	-	-	-
	OK08P707W-19C13	-0.5	0.2	-0.2	0.4	-	-	-	-	-	-	-
	OK0986130-7C13	0.0	-	-0.7	-1.0	-	-	-	-	-	-	-
	OK10126	-0.5	-	-	-	-	-	-0.4	-0.4	0.2	-	-
	OK1059060-2C14	0.0	-	1.5	-	-0.3	0.2	-0.1	0.0	-	-	0.8
	OK10728W	-	-0.1	-	-	0.5	-	0.2	0.5	-	-	-
	OK11231	-	-	-	-	-	-	-0.1	0.3	-	-	0.6
	OK11755W	-	-	-	-	0.4	-	0.1	0.4	-	-	-
	OK11D25056	-0.7	0.5	0.5	-	0.7	0.2	0.2	0.1	-	-	-0.1
	OK12621	-0.3	-	0.9	-	-	-	0.7	0.4	-	-	-
	OK13625	-	-	-	-	0.1	-	0.8	1.2	0.6	-	-
Mean		13.2	12.3	15.0	12.9	12.6	10.0	11.8	11.9	12.5	11.4	11.0
LSD (0.05)		0.6	0.3	1.0	1.8	0.4	0.7	0.4	0.4	0.4	0.9	0.8

Participating Seed Companies

AGSECO, Inc.

Steve Ahring, P.O. Box 7, Girard, KS 66743
Phone: 800-962-5429
Email: steve@delangeseed.com
www.agseco.com
Varieties: Hot Rod, TAM 113

Colorado Wheat Research Foundation (PlainsGold)

Darrell Hanavan, 4026 S. Timberline Rd. Ste. 100, Fort Collins, CO 80525
Phone: (970) 449-6994
Email: dhanavan@coloradowheat.org
Varieties: Byrd, Brawl CL Plus, CO11D174

Kansas Wheat Alliance (KWA)

Daryl Strouts, 1990 Kimball Ave.
Manhattan, KS 66502
Phone: (785) 320-4080
Email: kwa@kansas.net
www.kswheatalliance.org
Varieties: 1863, Everest, Hot Rod, KanMark, Oakley CL

Limagrain Cereal Seeds (LCS)

Marla Barnett, 6414 N Sheridan, Wichita, KS 67204
Phone: (316) 253-6839
Email: marla.barnett@limagrain.com
www.limagraincerealseeds.com
Varieties: LCS Mint, LCS Pistol, LCS Wizard, T153, T154, T158, LCH11-1117, LCH13DH-20-87, LCH13DH-14-91

Monsanto/WestBred

John Fenderson, 1616 E. Glencoe Rd., Stillwater, OK 74075
Phone: (620) 243-4263
Email: john.m.fenderson@monsanto.com
www.westbred.com
Varieties: WB4458, WB-Cedar, WB-Grainfield, WB-Redhawk, Winterhawk

Oklahoma Genetics Inc. (OGI)

Mark Hodges, P.O. Box 2113, Stillwater, OK 74076
Phone: (405) 744-7741
www.okgenetics.com
Varieties: Bentley, Billings, Centerfield, Doublestop CL Plus, Duster, Iba, Gallagher, Garrison, NF101, OK Bullet, OK Rising, Pete, Ruby Lee

Oklahoma Foundation Seed Services (OSU)

Jeff Wright, 2902 W. 6th Ave., Stillwater, OK 74074
Phone: (405) 744-7741
www.oklahomaseed.com
Varieties: Endurance, Deliver

Syngenta Seeds

Greg Gungoll, 1517 Osage Ave., Enid, OK 73703
Phone: (405) 714-2839
Email: greg.gungoll@syngenta.com
www.agriproheat.com
Varieties: Greer, Jackpot, SY Drifter, SY Flint, SY Llano, SY Southwind

Watley Seed

Andy Watley, Box 51, Spearman, TX 79081
Phone: (806) 659-3838
Email: watleyseed@valornet.com
www.watleyseed.com
Varieties: TAM 112, TAM 204

The Oklahoma Cooperative Extension Service

Bringing the University to You!

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.

Oklahoma State University, in compliance with Title VI and VII of the Civil Rights Act of 1964, Executive Order 11246 as amended, and Title IX of the Education Amendments of 1972 (Higher Education Act), the Americans with Disabilities Act of 1990, and other federal and state laws and regulations, does not discriminate on the basis of race, color, national origin, genetic information, sex, age, sexual orientation, gender identity, religion, disability, or status as a veteran, in any of its policies, practices or procedures. This provision includes, but is not limited to admissions, employment, financial aid, and educational services. The Director of Equal Opportunity, 408 Whitehurst, OSU, Stillwater, OK 74078-1035; Phone 405-744-5371; email: eeo@okstate.edu has been designated to handle inquiries regarding non-discrimination policies; Director of Equal Opportunity. Any person (student, faculty, or staff) who believes that discriminatory practices have been engaged in based on gender may discuss his or her concerns and file informal or formal complaints of possible violations of Title IX with OSU's Title IX Coordinator 405-744-9154.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of 84 cents per copy. Revised 1015. GH.