



Current Report

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

Protein Content of Winter Wheat Varieties in Oklahoma — 2018–2019

Robert Calhoun
Senior Agriculturalist

Amanda de Oliveira Silva
Small Grains Extension Specialist

Brett Carver
Wheat Breeder

Jeff Edwards
Department Head
Plant and Soil Sciences

General Information

Protein is just one of many attributes that determines 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 exist, variability in protein among environments is generally much larger than variability among varieties. Factors such as nitrogen (N) fertility and drought stress, for example, can sharply impact final protein wheat content.

To reflect these management and environmental impacts on wheat protein content, data is reported by variety and location in Table 1. In Table 2, we report the wheat protein content by variety as a deviation from location mean, this allows for easier comparison of wheat protein among varieties across locations. Doublestop CL Plus, for example, showed positive deviation from the location mean in 95 percent of this year's trials, indicating a tendency for above-average wheat protein content. Iba, on the other hand, showed a negative deviation from location mean in 90 percent of the trials, indicating a tendency for lower than average wheat protein content. Adequate N fertility as recommended by a recent soil test or sensor-based N management program can help ensure that varieties with low average protein produce wheat or flour protein within the acceptable range for end-use customers.

However, protein quantity should not be used as a barometer for protein quality (i.e., dough strength and functionality). Although, there are few exceptions to this, with Doublestop CL Plus being one example. 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 protein content. More information on end-use quality is available in CR-2165 Wheat and Flour Quality for Varieties Tested in the 2016 OSU Variety Performance Tests.

Procedures

Approximately 600-gram 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 OSU Cooperative Extension recommendations. Additional information on test locations and management practices is available in CR-2143 2018-2019 Oklahoma Small Grains Variety Performance Tests on the web at www.wheat.okstate.edu. Samples were stored in plastic containers for approximately one month following harvest. Samples were nondestructively analyzed for protein content on a 12 percent moisture basis 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:
Altus – OSU Southwest Research and Extension Center
Alva – Jerad Bradt & Wes Mallory
Apache – Bryan Vail
Balko – Kenton Patzkowsky
Buffalo – NRCS
Cherokee – Kenneth Failes
Chickasha – OSU South Central Research Station
Goodwell – Oklahoma Panhandle Research and Extension Center
Homestead – Brook Strader
Hooker – Dan Herald
Keyes – J.B. Stewart
Kildare – Don Schieber
Kingfisher – Tary Helt
Lahoma – OSU North Central Research Station
Lamont – Don & Roger Kirby
Thomas – Keith Miller & Bill Jackson
Union City – Don & Ray Bornemann
Walters – Jimmy Kinder

Table 1. Wheat protein content (12 percent moisture basis) of varieties and experimental lines tested in the 2018-2019 Oklahoma Wheat Variety Performance Tests.

Licensee	Variety	Apache							Chickasha		Goodwell	
		Altus	Alva	Apache	Fungicide	Balko	Buffalo	Cherokee	Chickasha	IWM	Irrigated	Homestead
		-----%wheat protein-----										
AGSECO	AG Gallant	11.1	11.2	-	-	10.6	9.3	11.9	13.0	12.1	12.9	-
AGSECO	AG Icon	12.3	11.8	-	-	10.7	10.1	13.7	13.6	13.1	13.5	12.9
AgriMAXX	AM Eastwood	9.6	11.2	12.0	10.5	10.3	-	13.5	13.7	12.1	12.3	11.8
OGI	Baker's Ann	11.0	-	-	-	10.3	-	13.6	13.7	13.0	13.6	-
OGI	Bentley	10.4	10.6	11.3	10.3	10.2	9.2	13.2	14.0	13.0	13.6	12.0
AgriPro	Bob Dole	11.2	11.0	-	-	-	10.5	13.1	13.3	12.3	14.5	12.5
PlainsGold	Canvas	9.4	-	-	-	-	-	-	13.6	13.0	12.1	-
CROPLAN	CP7826	10.2	11.1	11.6	10.9	10.2	-	13.4	14.3	12.9	15.6	11.9
CROPLAN	CP7869	10.5	-	-	-	-	-	-	14.7	12.8	13.0	-
CROPLAN	CP7909	10.2	-	-	-	-	-	-	12.4	11.6	12.1	-
PlainsGold	Crescent AX	9.6	-	-	-	-	-	-	12.8	12.5	12.2	-
OGI	Doublestop CL Plus	11.0	12.5	11.6	11.7	11.5	10.9	14.4	14.2	14.4	15.4	13.7
OGI	Duster	9.9	11.7	11.1	10.5	10.1	-	14.2	13.3	12.4	13.1	12.7
OGI	Gallagher	9.7	11.1	10.4	9.8	9.7	8.6	12.7	13.9	12.0	13.3	11.8
OGI	Green Hammer	11.0	-	11.6	11.2	-	-	14.3	13.5	13.9	-	13.6
OGI	Iba	10.1	10.8	11.6	10.5	10.1	9.4	12.4	13.2	11.9	12.2	11.6
KWA	Joe	10.7	10.6	-	-	9.6	-	12.4	12.8	12.1	12.5	11.7
KWA	KS Venada	10.4	-	-	-	-	-	-	12.6	13.2	13.4	-
KSU	KS080093K-18	10.8	-	-	-	-	-	-	13.4	13.4	12.9	-
PlainsGold	Langin	10.6	10.8	-	-	10.1	8.7	12.6	13.1	11.9	12.4	-
KWA	Larry	10.3	10.7	-	-	9.7	8.9	12.4	13.2	12.1	12.7	11.6
LCS	LCH15ACC7-7	10.7	-	-	-	-	-	-	13.4	12.3	12.9	-
LCS	LCS Chrome	11.3	11.2	11.7	11.4	11.0	10.1	13.2	14.5	13.6	13.3	12.6
LCS	LCS Pistol	10.3	-	-	-	-	-	-	14.3	12.9	13.0	-
OGI	Lonerider	10.1	11.4	-	-	9.9	9.8	13.8	15.0	13.0	13.4	-
Dyna-Gro	Long Branch	10.8	11.7	-	-	9.8	9.4	14.5	14.3	13.2	12.6	12.7
OGI	NF 101	10.9	-	11.2	10.5	-	-	-	12.8	12.6	13.7	-
OGI	Ruby Lee	10.3	11.7	10.9	11.1	10.9	-	13.2	12.7	12.9	14.1	11.6
OGI	Showdown	10.1	10.6	11.2	10.4	9.5	8.8	12.8	12.8	12.8	12.8	11.0
OGI	Skydance	11.1	11.9	10.7	10.7	-	-	-	13.3	13.3	14.5	-
OGI	Smith's Gold	10.1	11.7	10.7	10.5	10.2	9.3	13.4	13.4	13.1	13.4	12.1
OGI	Spirit Rider	10.2	-	-	-	-	-	-	14.1	12.1	13.0	12.5
OGI	Stardust	11.4	-	-	-	-	-	-	14.3	14.0	13.6	12.4
AgriPro	SY Achieve CL2	10.6	-	-	-	-	-	-	13.6	13.1	13.6	12.5
AgriPro	SY Benefit	10.1	-	10.9	10.4	-	-	-	12.4	12.1	12.2	11.0
AgriPro	SY Flint	10.5	-	10.7	10.5	-	-	-	12.8	12.1	13.1	11.5
AgriPro	SY Grit	10.9	10.5	11.5	10.4	9.6	9.1	13.2	14.0	13.5	12.6	12.4
AgriPro	SY Monument	-	11.1	-	-	10.2	-	13.2	-	-	12.9	11.7
AgriPro	SY Razor	11.1	-	11.4	11.3	-	-	-	12.8	13.1	-	-
AgriPro	SY Rugged	10.5	11.3	11.3	10.7	10.1	9.9	13.3	13.4	12.8	12.3	11.7
Watley	TAM 112	10.6	11.7	-	-	10.0	8.9	13.1	12.1	12.2	12.8	-
AGSECO	TAM 114	10.9	10.2	-	-	9.7	8.6	12.5	13.1	12.1	13.6	-
Watley	TAM 204	10.9	12.0	-	-	10.4	9.4	14.1	14.3	12.1	13.2	12.2
WestBred	WB4269	10.3	11.4	10.6	10.5	10.9	9.9	12.8	12.6	11.7	12.4	11.5
WestBred	WB4303	11.2	11.3	11.2	10.7	11.0	10.5	12.5	13.1	12.9	13.9	12.0
WestBred	WB4418	10.3	-	-	-	-	-	-	14.0	12.7	12.8	-
WestBred	WB4515	10.6	-	-	-	-	-	-	14.5	13.3	14.1	11.9
WestBred	WB4595	10.4	-	-	-	-	-	-	12.4	11.4	12.3	-
WestBred	WB4699	9.7	-	-	-	-	-	-	12.3	10.5	12.2	-
WestBred	WB4792	10.3	-	-	-	-	-	-	12.5	12.3	12.2	-
WestBred	WB-Grainfield	9.5	10.4	-	-	9.5	9.7	12.4	13.0	12.2	12.5	11.3
KWA	Zenda	10.1	-	-	-	-	-	-	12.3	12.1	13.0	-
OSU Experimentals												
	OCW04S717T-6W	-	-	-	-	-	-	-	14.2	13.6	-	13.5
	OK149132C	11.1	11.4	-	-	-	-	-	13.6	12.5	13.9	-
	OK14P212	11.0	10.9	12.4	10.2	9.6	9.5	14.0	-	-	12.7	12.1
	OK14P736W	11.1	10.6	12.5	10.7	10.6	9.4	13.1	13.0	12.1	12.1	-
	OK15MASBx7 8-1	-	-	-	-	-	-	-	-	-	-	-
	OK16729W	11.1	-	-	-	-	-	-	-	-	12.2	-
	OK168512	-	11.6	-	-	10.2	9.3	13.7	-	-	13.1	-
	OK16D101089	10.6	-	-	-	-	-	-	12.9	12.6	-	-
	Mean	10.6	11.2	11.3	10.7	10.2	9.5	13.2	13.4	12.6	13.1	12.1
	LSD (0.05)	1.1	0.5	0.6	0.7	0.3	0.8	0.6	0.6	0.6	0.5	0.4

Note: shaded values are not statistically different from the greatest value within a column (i.e., location).

Table 1. Wheat protein content (12 percent moisture basis) of varieties and experimental lines tested in the 2018-2019 Oklahoma Wheat Variety Performance Tests (cont'd).

Licensee	Variety	%wheat protein									
		Hooker	Keyes	Kildare	Kingfisher	Lahoma	Lahoma Fungicide	Lamont	Thomas	Union City	Walters
AGSECO	AG Gallant	14.8	12.7	-	-	11.9	11.6	-	-	-	-
AGSECO	AG Icon	15.4	12.5	13.1	11.7	14.1	13.8	14.5	14.2	12.9	-
AgriMAXX	AM Eastwood	14.4	12.9	11.6	10.1	14.4	13.2	14.0	13.6	13.8	12.6
OGI	Baker's Ann	14.9	-	12.5	-13.9	13.6	14.7	-	-	-	-
OGI	Bentley	13.8	12.9	12.0	10.3	13.0	12.9	13.2	13.2	13.2	12.0
AgriPro	Bob Dole	-	-	11.9	12.1	12.9	12.8	13.0	-	-	-
PlainsGold	Canvas	-	-	-	-	13.2	12.5	-	-	-	-
CROPLAN	CP7826	17.2	14.0	13.0	12.5	13.5	13.0	13.7	15.0	12.7	11.8
CROPLAN	CP7869	-	-	-	-	13.6	12.7	-	-	-	-
CROPLAN	CP7909	-	-	-	-	12.2	11.3	-	-	-	-
PlainsGold	Crescent AX	-	-	-	-	11.8	11.8	-	-	-	-
OGI	Doublestop CL Plus	15.5	14.5	13.4	12.7	13.7	13.9	13.9	14.6	12.6	13.5
OGI	Duster	14.8	12.1	-	11.6	13.5	12.8	14.9	13.9	12.7	11.9
OGI	Gallagher	15.8	12.9	12.1	11.2	12.5	12.3	14.1	13.7	12.8	11.3
OGI	Green Hammer	-	-	13.4	13.2	13.9	14.4	14.6	14.0	13.1	13.3
OGI	Iba	13.7	11.9	11.7	11.2	12.8	11.9	13.3	13.3	12.7	11.3
KWA	Joe	13.4	12.3	11.9	11.2	12.8	12.3	12.6	-	-	-
KWA	KS Venada	-	-	-	-	12.9	13.0	-	-	-	-
KSU	KS080093K-18	-	-	-	-	13.4	12.9	-	-	-	-
PlainsGold	Langin	13.3	11.4	-	-	12.4	12.1	-	-	-	-
KWA	Larry	13.8	12.8	-	10.3	13.3	12.2	12.9	13.2	-	-
LCS	LCH15ACC7-7	-	-	-	-	12.8	12.2	-	-	-	-
LCS	LCS Chrome	14.8	13.4	12.9	12.4	13.7	13.6	13.9	14.1	12.4	12.0
LCS	LCS Pistol	-	-	-	-	13.9	12.8	-	-	-	-
OGI	Lonerider	14.5	13.3	-	-	14.6	12.7	-	-	-	-
Dyna-Gro	Long Branch	13.5	11.9	-	11.4	14.0	13.1	-	13.4	13.7	-
OGI	NF 101	-	-	-	-	12.6	12.9	-	-	12.8	11.8
OGI	Ruby Lee	15.1	13.7	12.2	11.0	12.4	13.4	13.0	12.9	11.8	13.1
OGI	Showdown	13.9	12.2	12.2	10.5	12.9	12.0	13.5	12.9	13.0	11.0
OGI	Skydance	-	-	-	-	13.6	13.6	-	-	-	13.5
OGI	Smith's Gold	14.0	12.5	12.7	10.9	13.4	12.6	14.3	13.1	12.9	11.5
OGI	Spirit Rider	-	-	12.9	-	13.9	13.5	14.1	-	-	-
OGI	Stardust	-	-	12.9	-	14.3	13.3	14.4	-	-	-
AgriPro	SY Achieve CL2	-	-	12.6	10.7	13.9	13.2	14.0	-	-	-
AgriPro	SY Benefit	-	-	-	-	10.2	12.5	11.7	12.1	-	-
AgriPro	SY Flint	-	-	-	11.3	12.4	12.1	12.9	12.4	12.6	12.0
AgriPro	SY Grit	15.0	-	13.0	11.8	10.1	13.4	13.0	13.6	13.1	13.1
AgriPro	SY Monument	14.4	12.4	-	11.0	13.0	12.6	13.2	13.7	-	-
AgriPro	SY Razor	-	-	-	-	-	-	-	-	11.9	-
AgriPro	SY Rugged	13.9	12.1	12.0	11.4	13.5	13.1	13.8	14.1	12.7	11.2
Watley	TAM 112	14.3	12.6	-	-	14.0	12.6	-	-	-	-
AGSECO	TAM 114	14.5	13.1	-	-	13.1	12.5	-	-	-	-
Watley	TAM 204	14.7	12.6	-	11.1	15.0	12.7	-	14.7	13.4	-
WestBred	WB4269	13.8	12.5	12.1	10.8	12.8	12.0	13.4	12.9	12.1	11.7
WestBred	WB4303	16.0	13.6	12.6	10.6	13.4	13.9	13.3	13.3	13.0	-
WestBred	WB4418	-	-	-	-	14.3	13.1	-	-	-	-
WestBred	WB4515	-	-	12.0	11.9	13.8	13.3	14.1	12.9	13.5	-
WestBred	WB4595	-	-	-	-	12.8	12.1	-	-	-	-
WestBred	WB4699	-	-	-	-	12.2	11.6	-	-	-	-
WestBred	WB4792	-	-	-	-	12.1	11.9	-	-	-	-
WestBred	WB-Grainfield	13.8	12.0	-	9.9	13.2	12.3	13.1	-	-	-
KWA	Zenda	-	-	11.6	-	12.2	12.5	12.5	-	-	-
OSU Experimentals											
	OCW04S717T-6W	-	-	-	10.6	13.5	14.0	-	-	12.3	-
	OK149132C	-	-	-	12.5	13.3	12.5	-	12.8	13.2	-
	OK14P212	14.5	12.8	-	-	-	-	-	14.2	13.5	11.0
	OK14P736W	13.8	12.4	-	-	-	-	-	-	-	11.8
	OK15MASBx7 8-1	-	-	-	-	13.1	12.2	-	-	-	-
	OK16729W	-	-	-	-	12.3	12.1	-	-	-	-
	OK168512	13.6	12.2	-	-	-	-	-	-	-	-
	OK16D101089	-	-	12.3	11.1	12.4	12.8	-	13.5	12.4	12.0
	Mean	14.5	12.7	12.4	11.2	13.2	12.7	13.6	13.6	12.8	12.0
	LSD (0.05)	0.5	0.8	0.6	1.0	0.5	0.4	0.5	0.7	0.6	0.6

Note: shaded values are not statistically different from the greatest value within a column (i.e., location).

Table 2. Wheat protein content relative to the location mean (expressed as a deviation) for varieties and experimental lines in the 2018-2019 Oklahoma Wheat Variety Performance Tests.

Licensee	Variety	% wheat protein relative to location mean										
		Altus	Alva	Apache	Apache Fungicide	Balko	Buffalo	Cherokee	Chickasha	Chickasha IWM	Goodwell Irrigated	Homestead
AGSECO	AG Gallant	0.5	0.0	-	-	0.4	-0.2	-1.3	-0.4	-0.5	-0.2	-
AGSECO	AG Icon	1.7	0.6	-	-	0.5	0.6	0.5	0.2	0.5	0.4	0.8
AgriMAXX	AM Eastwood	-1.0	0.0	0.7	-0.2	0.1	-	0.3	0.3	-0.5	-0.8	-0.4
OGI	Baker's Ann	0.4	-	-	-	0.1	-	0.4	0.3	0.4	0.5	-
OGI	Bentley	-0.3	-0.6	-0.1	-0.4	0.0	-0.3	0.0	0.6	0.4	0.5	-0.1
AgriPro	Bob Dole	0.6	-0.2	-	-	-	1.0	-0.1	-0.1	-0.3	1.4	0.4
PlainsGold	Canvas	-1.2	-	-	-	-	-	-	0.2	0.4	-1.0	-
CROPLAN	CP7826	-0.4	-0.1	0.3	0.2	0.0	-	0.2	0.9	0.3	2.5	-0.2
CROPLAN	CP7869	-0.1	-	-	-	-	-	-	1.3	0.2	-0.1	-
CROPLAN	CP7909	-0.4	-	-	-	-	-	-	-1.0	-1.0	-1.0	-
PlainsGold	Crescent AX	-1.1	-	-	-	-	-	-	-0.6	-0.1	-0.9	-
OGI	Doublestop CL Plus	0.4	1.3	0.3	1.0	1.3	1.4	1.2	0.8	1.8	2.3	1.6
OGI	Duster	-0.8	0.5	-0.2	-0.3	-0.1	-	1.0	-0.1	-0.2	0.0	0.6
OGI	Gallagher	-0.9	-0.1	-0.9	-0.9	-0.5	-0.9	-0.5	0.5	-0.6	0.2	-0.3
OGI	Green Hammer	0.4	-	0.3	0.5	-	-	1.1	0.1	1.3	-	1.5
OGI	Iba	-0.5	-0.4	0.3	-0.3	-0.1	-0.1	-0.8	-0.2	-0.7	-0.9	-0.5
KWA	Joe	0.1	-0.6	-	-	-0.6	-	-0.8	-0.6	-0.5	-0.6	-0.4
KWA	KS Venada	-0.2	-	-	-	-	-	-	-0.8	0.6	0.3	-
KSU	KS080093K-18	0.2	-	-	-	-	-	-	0.0	0.8	-0.2	-
PlainsGold	Langin	0.0	-0.4	-	-	-0.1	-0.8	-0.6	-0.3	-0.7	-0.7	-
KWA	Larry	-0.3	-0.5	-	-	-0.5	-0.6	-0.8	-0.2	-0.5	-0.4	-0.5
LCS	LCH15ACC7-7	0.1	-	-	-	-	-	-	0.0	-0.3	-0.2	-
LCS	LCS Chrome	0.7	0.0	0.4	0.7	0.8	0.6	0.0	1.1	1.0	0.2	0.5
LCS	LCS Pistol	-0.3	-	-	-	-	-	-	0.9	0.3	-0.1	-
OGI	Lonerider	-0.5	0.2	-	-	-0.3	0.3	0.6	1.6	0.4	0.3	-
Dyna-Gro	Long Branch	0.2	0.5	-	-	-0.4	-0.1	1.3	0.9	0.6	-0.5	0.6
OGI	NF 101	0.3	-	-0.2	-0.2	-	-	-	-0.6	0.0	0.6	-
OGI	Ruby Lee	-0.3	0.5	-0.4	0.4	0.7	-	0.0	-0.7	0.3	1.0	-0.5
OGI	Showdown	-0.5	-0.6	-0.2	-0.3	-0.7	-0.7	-0.4	-0.6	0.2	-0.3	-1.1
OGI	Skydance	0.5	0.7	-0.6	0.0	-	-	-	-0.1	0.7	1.4	-
OGI	Smith's Gold	-0.5	0.5	-0.6	-0.2	0.0	-0.2	0.2	0.0	0.5	0.3	0.0
OGI	Spirit Rider	-0.4	-	-	-	-	-	-	0.7	-0.5	-0.1	0.4
OGI	Stardust	0.8	-	-	-	-	-	-	0.9	1.4	0.5	0.3
AgriPro	SY Achieve CL2	0.0	-	-	-	-	-	-	0.2	0.5	0.5	0.4
AgriPro	SY Benefit	-0.5	-	-0.4	-0.3	-	-	-	-1.0	-0.5	-0.9	-1.1
AgriPro	SY Flint	-0.1	-	-0.6	-0.3	-	-	-	-0.6	-0.5	0.0	-0.6
AgriPro	SY Grit	0.3	-0.7	0.2	-0.3	-0.6	-0.4	0.0	0.6	0.9	-0.5	0.3
AgriPro	SY Monument	-	-0.1	-	-	0.0	-	0.0	-	-	-0.3	-0.4
AgriPro	SY Razor	0.5	-	0.1	0.6	-	-	-	-0.6	0.5	-	-
AgriPro	SY Rugged	-0.1	0.1	-0.1	0.0	-0.1	0.4	0.1	0.0	0.2	-0.8	-0.4
Watley	TAM 112	0.0	0.5	-	-	-0.2	-0.6	-0.1	-1.3	-0.4	-0.3	-
AGSECO	TAM 114	0.3	-1.0	-	-	-0.5	-0.9	-0.7	-0.3	-0.5	0.5	-
Watley	TAM 204	0.3	0.8	-	-	0.2	-0.1	0.9	0.9	-0.5	0.1	0.1
WestBred	WB4269	-0.4	0.2	-0.7	-0.3	0.7	0.4	-0.4	-0.8	-0.9	-0.7	-0.6
WestBred	WB4303	0.6	0.1	-0.1	0.0	0.8	1.0	-0.7	-0.3	0.3	0.8	-0.1
WestBred	WB4418	-0.3	-	-	-	-	-	-	0.6	0.1	-0.3	-
WestBred	WB4515	0.0	-	-	-	-	-	-	1.1	0.7	1.0	-0.2
WestBred	WB4595	-0.2	-	-	-	-	-	-	-1.0	-1.2	-0.8	-
WestBred	WB4699	-0.9	-	-	-	-	-	-	-1.1	-2.1	-0.9	-
WestBred	WB4792	-0.3	-	-	-	-	-	-	-0.9	-0.3	-0.9	-
WestBred	WB-Grainfield	-1.2	-0.8	-	-	-0.7	0.2	-0.8	-0.4	-0.4	-0.6	-0.8
KWA	Zenda	-0.5	-	-	-	-	-	-	-1.1	-0.5	-0.1	-
OSU Experimentals												
	OCW04S717T-6W	-	-	-	-	-	-	-	0.8	1.0	-	1.4
	OK149132C	0.5	0.2	-	-	-	-	-	0.2	-0.1	0.8	-
	OK14P212	0.4	-0.3	1.1	-0.5	-0.6	0.0	0.8	-	-	-0.4	0.0
	OK14P736W	0.5	-0.6	1.2	0.0	0.4	-0.1	-0.1	-0.4	-0.5	-1.0	-
	OK15MASBx7 8-1	-	-	-	-	-	-	-	-	-	-	-
	OK16729W	0.5	-	-	-	-	-	-	-	-	-0.9	-
	OK168512	-	0.4	-	-	0.0	-0.2	0.5	-	-	0.0	-
	OK16D101089	0.0	-	-	-	-	-	-	-0.5	0.0	-	-

Table 2. Wheat protein content relative to the location mean (expressed as a deviation) for varieties and experimental lines in the 2018-2019 Oklahoma Wheat Variety Performance Tests (cont'd).

Licensee	Variety	% wheat protein relative to location mean									
		Hooker	Keyes	Kildare	Kingfisher	Lahoma	Lahoma Fungicide	Lamont	Thomas	Union City	Walters
AGSECO	AG Gallant	0.3	0.0	-	-	-1.3	-1.1	-	-	-	-
AGSECO	AG Icon	0.9	-0.2	0.7	0.5	0.9	1.1	0.9	0.6	0.1	-
AgriMAXX	AM Eastwood	-0.1	0.2	-0.9	-1.1	1.2	0.5	0.4	0.0	1.0	0.6
OGI	Baker's Ann	0.4	-	0.1	-	0.7	0.9	1.1	-	-	-
OGI	Bentley	-0.7	0.2	-0.4	-0.9	-0.2	0.2	-0.4	-0.4	0.4	0.0
AgriPro	Bob Dole	-	-	-0.5	0.9	-0.3	0.1	-0.6	-	-	-
PlainsGold	Canvas	-	-	-	-	0.0	-0.2	-	-	-	-
CROPLAN	CP7826	2.7	1.3	0.6	1.3	0.3	0.3	0.1	1.4	-0.1	-0.2
CROPLAN	CP7869	-	-	-	-	0.4	0.0	-	-	-	-
CROPLAN	CP7909	-	-	-	-	-1.0	-1.4	-	-	-	-
PlainsGold	Crescent AX	-	-	-	-	-1.4	-0.9	-	-	-	-
OGI	Doublestop CL Plus	1.0	1.8	1.0	1.5	0.5	1.2	0.3	1.0	-0.2	1.5
OGI	Duster	0.3	-0.6	-	0.4	0.3	0.1	1.3	0.3	-0.1	-0.1
OGI	Gallagher	1.3	0.2	-0.3	0.0	-0.7	-0.4	0.5	0.1	0.0	-0.7
OGI	Green Hammer	-	-	1.0	2.0	0.7	1.7	1.0	0.4	0.3	1.3
OGI	Iba	-0.8	-0.8	-0.7	0.0	-0.4	-0.8	-0.3	-0.3	-0.1	-0.7
KWA	Joe	-1.1	-0.4	-0.5	0.0	-0.4	-0.4	-1.0	-	-	-
KWA	KS Venada	-	-	-	-	-0.3	0.3	-	-	-	-
KSU	KS080093K-18	-	-	-	-	0.2	0.2	-	-	-	-
PlainsGold	Langin	-1.2	-1.3	-	-	-0.8	-0.6	-	-	-	-
KWA	Larry	-0.7	0.1	-	-0.9	0.1	-0.5	-0.7	-0.4	-	-
LCS	LCH15ACC7-7	-	-	-	-	-0.4	-0.5	-	-	-	-
LCS	LCS Chrome	0.3	0.7	0.4	1.2	0.5	0.9	0.3	0.5	-0.4	0.0
LCS	LCS Pistol	-	-	-	-	0.7	0.1	-	-	-	-
OGI	Lonerider	0.0	0.6	-	-	1.4	0.0	-	-	-	-
Dyna-Gro	Long Branch	-1.0	-0.8	-	0.2	0.8	0.4	-	-0.2	0.9	-
OGI	NF 101	-	-	-	-	-0.6	0.2	-	-	0.0	-0.2
OGI	Ruby Lee	0.6	1.0	-0.2	-0.2	-0.8	0.7	-0.6	-0.7	-1.0	1.1
OGI	Showdown	-0.6	-0.5	-0.2	-0.8	-0.3	-0.7	-0.1	-0.7	0.2	-1.0
OGI	Skydance	-	-	-	-	0.4	0.9	-	-	-	1.5
OGI	Smith's Gold	-0.5	-0.2	0.3	-0.3	0.2	-0.1	0.7	-0.5	0.1	-0.6
OGI	Spirit Rider	-	-	0.5	-	0.7	0.8	0.5	-	-	-
OGI	Stardust	-	-	0.5	-	1.1	0.6	0.8	-	-	-
AgriPro	SY Achieve CL2	-	-	0.2	-0.5	0.7	0.5	0.4	-	-	-
AgriPro	SY Benefit	-	-	-	-1.0	-0.7	-1.0	-1.5	-	-	-0.7
AgriPro	SY Flint	-	-	-	0.1	-0.8	-0.6	-0.7	-1.2	-0.2	0.0
AgriPro	SY Grit	0.5	0.3	-0.6	-1.1	0.2	0.3	0.0	-0.5	0.3	0.3
AgriPro	SY Monument	-0.1	-0.3	-	-0.2	-0.2	-0.1	-0.4	0.1	-	-
AgriPro	SY Razor	-	-	-	-	-	-	-	-	-0.9	-
AgriPro	SY Rugged	-0.6	-0.6	-0.4	0.2	0.3	0.4	0.2	0.5	-0.1	-0.8
Watley	TAM 112	-0.2	-0.1	-	-	0.8	-0.1	-	-	-	-
AGSECO	TAM 114	0.0	0.4	-	-	-0.1	-0.2	-	-	-	-
Watley	TAM 204	0.2	-0.1	-	-0.1	1.8	0.0	-	1.1	0.6	-
WestBred	WB4269	-0.7	-0.2	-0.3	-0.4	-0.4	-0.7	-0.2	-0.7	-0.7	-0.3
WestBred	WB4303	1.5	0.9	0.2	-0.6	0.2	1.2	-0.3	-0.3	0.2	-
WestBred	WB4418	-	-	-	-	1.1	0.4	-	-	-	-
WestBred	WB4515	-	-	-0.4	0.7	0.6	0.6	0.5	-0.7	0.7	-
WestBred	WB4595	-	-	-	-	-0.4	-0.6	-	-	-	-
WestBred	WB4699	-	-	-	-	-1.0	-1.2	-	-	-	-
WestBred	WB4792	-	-	-	-	-1.1	-0.8	-	-	-	-
WestBred	WB-Grainfield	-0.7	-0.7	-	-1.3	0.0	-0.4	-0.5	-	-	-
KWA	Zenda	-	-	-0.8	-	-1.0	-0.2	-1.1	-	-	-
OSU Experimentals											
	OCW04S717T-6W	-	-	-	-0.6	0.3	1.3	-	-	-0.5	-
	OK149132C	-	-	-	1.3	0.1	-0.2	-	-0.8	0.4	-
	OK14P212	0.0	0.1	-	-	-	-	-	0.6	0.7	-1.0
	OK14P736W	-0.7	-0.3	-	-	-	-	-	-	-	-0.2
	OK15MASBx7 8-1	-	-	-	-	-0.1	-0.5	-	-	-	-
	OK16729W	-	-	-	-	-0.9	-0.6	-	-	-	-
	OK168512	-0.9	-0.5	-	-	-	-	-	-	-	-
	OK16D101089	-	-	-0.1	-0.1	-0.8	0.1	-	-0.1	-0.4	0.0

PARTICIPATING SEED COMPANIES

AgriMAXX Wheat Company

Matt Wehmeyer
7167 Highbanks Road
Mascoutah, IL 62258
Phone: (855) 629-9432
Email: matt@agrimaxxwheat.com
www.agrimaxxwheat.com
Variety: AM Eastwood

AgriPro

Greg Gungoll
1517 Osage Ave.
Enid, OK 73703
Phone: (405) 714-2839
Email: greg.gungoll@syngenta.com
www.agriprowheat.com
Varieties: Bob Dole, SY Achieve CL2, SY Benefit, SY Flint, SY Grit, SY Monument, SY Razor, SY Rugged

AGSECO, Inc.

Steve Ahring
P.O. Box 7
Girard, KS 66743
Phone: (620) 724-6223
Email: steve@delangeseed.com
www.agseco.com
Varieties: AG Gallant, AG Icon, TAM 114

CROPLAN by Winfield United

Mark Torno
225 Marina Way
Garrison, ND 58540
Phone: (651) 375-6448
Email: MTorno@landolakes.com
www.winfieldunited.com/product/croplan-seed
Variety: CP7826, CP7869, CP7909

Dyna-Gro Seed

Shawn Carter
3492 Long Prairie Road Suite 200
Flower Mound, TX 75022
Phone: (318) 282-9804
Email: shawn.carter@nutrien.com
www.dynagroseed.com
Variety: Long Branch

Kansas Wheat Alliance (KWA)

Daryl Strouts
1990 Kimball Avenue Suite 200
Manhattan, KS 66502
Phone: (785) 320-4080
Email: kwa@kansas.net
www.kswheatalliance.org
Varieties: Joe, KS Venada, KS080093K-18, Larry, Zenda

Limagrain Cereal Seeds (LCS)

Drew Hendricker
2040 SE Frontage Road
Fort Collins, CO 80525
Phone: (970) 498-2218
Email: drew.hendricker@limagrain.com
www.limagraincerealseeds.com
Varieties: LCH15ACC7-7, LCS Chrome, LCS Pistol

Oklahoma Genetics Inc. (OGI)

Mark Hodges
201 South Ranger Road
Stillwater, OK 74074
Phone: (405) 744-4347
www.okgenetics.com
Varieties: Baker's Ann, Bentley, Doublestop CL Plus, Duster, Gallagher, Green Hammer, Iba, Lonerider, NF 101, Ruby Lee, Showdown, Skydance, Smith's Gold, Spirit Rider, Stardust

PlainsGold (Colorado Wheat Research Foundation)

Brad Erker/Tyler Benninghoven
4026 S. Timberline Road. Ste. 100
Fort Collins, CO 80525
Phone: (970) 449-6994
www.coloradowheat.org
Variety: Canvas, Crescent AX, Langin

Watley Seed

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

WestBred

John Fenderson
1616 E. Glencoe Road
Stillwater, OK 74075
Phone: (620) 243-4263
Email: john.m.fenderson@monsanto.com
www.westbred.com
Varieties: WB4269, WB4303, WB4418, WB4515, WB4595, WB4699, WB4792, WB-Grainfield

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, as an equal opportunity employer, complies with all applicable federal and state laws regarding non-discrimination and affirmative action. Oklahoma State University is committed to a policy of equal opportunity for all individuals and does not discriminate based on race, religion, age, sex, color, national origin, marital status, sexual orientation, gender identity/expression, disability, or veteran status with regard to employment, educational programs and activities, and/or admissions. For more information, visit <https://eeo.okstate.edu>.

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 for Agricultural Programs and has been prepared and distributed at a cost of 20 cents per copy. 0919 GH.