



# Current Report

Oklahoma Cooperative Extension Fact Sheets are also available on our website at:  
[osufacts.okstate.edu](http://osufacts.okstate.edu)

## Fall forage production and date of first hollow stem in winter wheat varieties during the 2012-2013 crop year

Jeff Edwards  
Small Grains Extension Specialist

Richard Austin  
Senior Agriculturalist

Matt Knori  
Research Technician

Romulo Lollato  
Graduate Research Assistant

Giovana Cruppe  
Graduate Research Assistant

### 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 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 Chickasha and Stillwater, OK test sites. Weather data for these two sites are provided in Figures 1 and 2.

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 approximately ½ inch above the soil surface 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

With the exceptions of a few localized areas with adequate rainfall, wheat forage was extremely short in 2012 – 2013. The season started with severe drought and inadequate soil moisture that made seedbed preparation and wheat stand establishment extremely difficult. Approximately one half to one inch of rain fell across much of the state in mid September and allowed wheat to emerge (Figures 1 and 2).

Chickasha received much needed rain around the first of October that allowed for ample forage growth and tiller survival through the winter. Conversely, most of Oklahoma remained extremely dry through the winter and early emerging fields turned brown, sloughed tillers, and appeared to be dying or dead by late winter. Late-February rainfall allowed for an astounding wheat recovery in central and northern Oklahoma. Conditions never really improved in southwestern and western Oklahoma.

Due to the extended drought, forage measurements were not collected at Stillwater until March 1, 2013 (Table 2). Forage yields ranged from 2,060 lbs/ac for Deliver to 3,080 lbs/ac for Endurance. As is usually the case, there was a large group of varieties that produced statistically equal forage yield. Forage growth at Chickasha was adequate for fall measurement and forage production was similar to that measured at Stillwater.

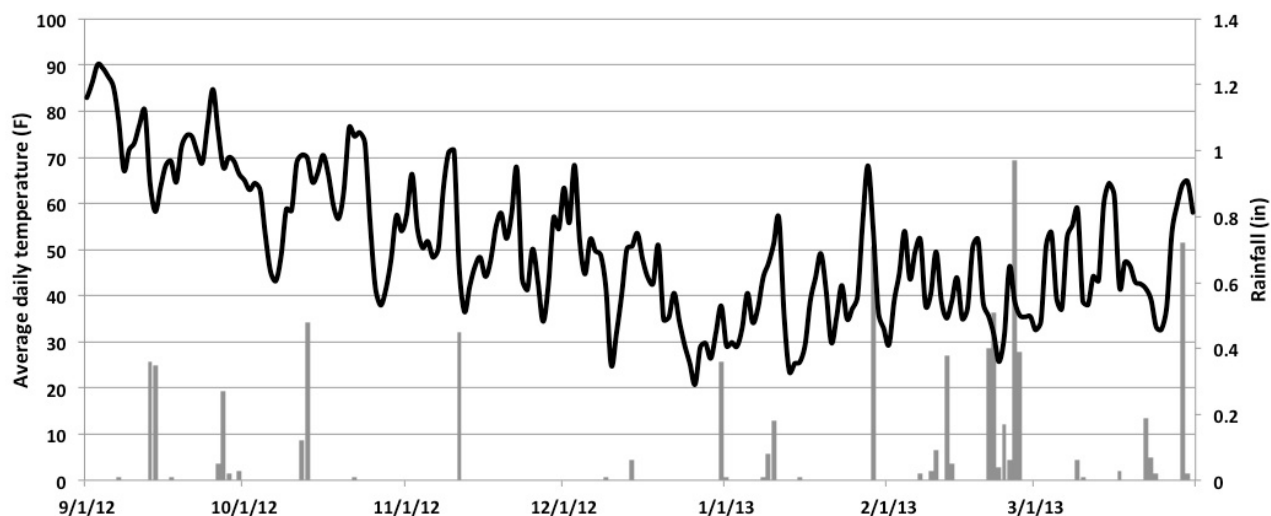


Figure 1. Average daily temperature (line graph) and rainfall (bar chart) from September 1, 2012 to March 31, 2013 at Stillwater, OK. Weather data courtesy Oklahoma Mesonet.

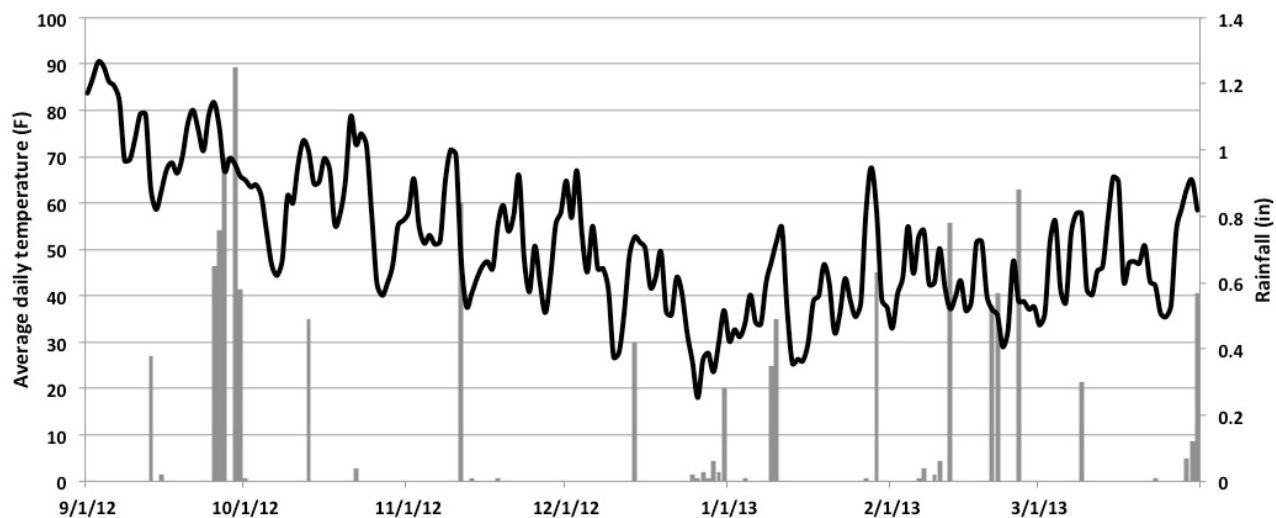


Figure 2. Average daily temperature (line graph) and rainfall (bar chart) from September 1, 2012 to March 31, 2013 at Chickasha, OK. Weather data courtesy Oklahoma Mesonet.

Table 1. Location information.

	<i>Planting date</i>	<i>Sampling date</i>	<i>pH</i>	<i>N</i>	<i>P</i>	<i>K</i>
Chickasha	09/20/12	12/06/12	6.7	172	62	424
Stillwater*	09/18/12	03/01/13	5.7	140	157	373

\*Stillwater fertility information estimated based on previous-year soil test and pre-plant nitrogen fertilizer application.

three months later. Forage yields at Chickasha ranged from 1,990 lbs/ac for Deliver to 3,110 lbs/ac for Gallagher.

First hollow stem data are reported in 'day of year' (day) format (Table 4). To provide reference, keep in mind that March 1 is day 60. Average occurrence of first hollow stem at Stillwater and Chickasha in 2013 was day 72 and 65, respectively. This was approximately 20 days later than in 2012 and was probably the result of drought combined with cooler than normal temperatures. There was a 30-day range in occurrence of first hollow stem at Stillwater and Chickasha. Occurrence of first hollow stem at Chickasha was approximately one week earlier than Stillwater, but the relative rankings of varieties (i.e. early, medium, or late) were fairly consistent between locations.

## **Acknowledgments**

The authors want to thank the Oklahoma Wheat Commission and the Oklahoma Wheat Research Foundation for providing partial funding for this research. We also acknowledge the hard work of Mason Jones, undergraduate student worker, in collecting the data presented in this report.

### Seed Source Abbreviations

AGSECO = AGSECO Inc.  
CWRF = Colorado Wheat Research Foundation  
KWA = Kansas Wheat Alliance  
LCS = Limagrain Cereal Seeds  
OGI = Oklahoma Genetics Inc.  
OSU = Oklahoma State University  
Syngenta = Syngenta Seeds

**Table 2. Forage production by winter wheat varieties prior to first hollow stem at Stillwater, OK during the 2012-2013 production year.**

Source	Variety	2012-2013	2-Year	3-Year	4-Year
-----lbs dry forage/acre-----					
OSU	Endurance	3,080	3,420	3,230	3,030
WestBred	WB-Grainfield	2,930	-	-	-
WestBred	WB-Cedar	2,920	3,100	2,960	-
WestBred	Armour	2,880	3,090	3,070	2,920
OGI	Garrison	2,850	3,140	3,000	2,710
OSU	Doublestop CL Plus	2,840	-	-	-
OGI	Gallagher	2,820	3,420	-	-
LCS	LCH08-80	2,770	-	-	-
CWRF	Brawl CL Plus	2,750	-	-	-
LCS	T153	2,730	3,150	-	-
OGI	Duster	2,690	3,120	3,020	2,970
WestBred	WB-Duece CL+	2,690	-	-	-
Syngenta	Greer	2,630	2,920	2,910	2,720
KWA	Jagger	2,620	3,150	2,900	2,750
OGI	Iba	2,600	3,080	3,090	-
KWA	Everest	2,570	2,990	2,800	2,590
OGI	Billings	2,550	2,960	2,960	2,830
OGI	Centerfield	2,550	3,140	3,020	2,830
CWRF	Byrd	2,520	-	-	-
Syngenta	Jackpot	2,520	2,920	2,870	2,780
LCS	T158	2,490	2,990	2,930	-
Syngenta	CJ	2,480	2,910	-	-
OGI	Pete	2,450	2,950	2,920	2,770
LCS	T154	2,440	-	-	-
LCS	T173	2,390	-	-	-
LCS	LCH08-109	2,320	-	-	-
WestBred	WB-Redhawk	2,320	-	-	-
LCS	LCS Mint	2,290	-	-	-
Syngenta	Razor	2,260	-	-	-
OGI	Ruby Lee	2,250	2,860	2,890	2,800
WestBred	WB4458	2,230	-	-	-
AGSECO	TAM 113	2,220	2,780	-	-
OGI	OK Bullet	2,170	2,680	2,690	2,700
WestBred	Winterhawk	2,100	2,790	2,820	2,650
OSU	Deliver	2,060	2,790	2,740	2,650
<b>Experimentals</b>					
	OK09935C	2,960	-	-	-
	OK09528	2,920	-	-	-
	OK09634	2,490	-	-	-
	OK09729	2,420	-	-	-
	OK09125	2,290	-	-	-
	OK08328	2,190	-	-	-
<b>Average</b>		<b>2,540</b>	<b>3,020</b>	<b>2,930</b>	<b>2,780</b>
LSD		610	420	350	270

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

**Table 3. Fall forage production by winter wheat varieties at Chickasha, OK in 2012.**

Source	Variety	2012 -----lbs dry forage/acre-----
OGI	Gallagher	3,110
LCS	T154	2,920
OGI	Duster	2,910
KWA	Everest	2,740
Syngenta	CJ	2,710
WestBred	WB-Cedar	2,670
OSU	Endurance	2,620
Syngenta	Greer	2,570
OGI	Iba	2,470
OGI	Ruby Lee	2,450
Syngenta	Razor	2,420
Syngenta	Jackpot	2,380
OGI	Pete	2,350
WestBred	WB-Redhawk	2,290
OGI	Garrison	2,270
LCS	T158	2,260
WestBred	Armour	2,190
LCS	T153	2,180
KWA	Jagger	2,080
OSU	Deliver	1,990
<b>Experimentals</b>		
	OK08328	2,360
<hr/>		
	<b>Average</b>	<b>2,470</b>
	LSD	440

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

**Table 4. Occurrence of first hollow stem (day of year) for winter wheat varieties sown in 2012 and measured in 2013 at Stillwater and Chickasha, OK.**

Source	Variety	Stillwater	Chickasha
		-----day of year-----	
WestBred	WB-Duece CL+	54	-
KWA	Everest	56	47
WestBred	WB4458	58	-
Syngenta	Razor	62	52
OGI	Ruby Lee	62	67
OGI	Garrison	64	70
Syngenta	Jackpot	64	65
LCS	T153	64	62
LCS	T154	64	62
WestBred	WB-Redhawk	64	62
WestBred	Armour	68	65
KWA	Jagger	68	55
OGI	Billings	70	-
OGI	OK Rising	70	-
WestBred	WB-Cedar	70	67
WestBred	Winterhawk	70	-
CWRF	Byrd	72	-
OSU	Deliver	72	72
OGI	Duster	72	72
OGI	Gallgher	72	49
OGI	OK Bullet	72	-
Syngenta	Greer	75	59
LCS	LCH08 - 109	75	-
OGI	Pete	75	77
LCS	T158	75	77
WestBred	WB-Grainfield	75	-
OGI	Centerfield	77	-
OSU	Doublestop CL Plus	77	-
LCS	T173	77	-
AGSECO	TAM 113	77	-
CWRF	Brawl CL+	80	-
Syngenta	CJ	80	70
OSU	Endurance	80	77
OGI	Iba	80	70
LCS	LCS Mint	80	-
LCS	LCH08-80	84	-
<b>Experimentals</b>			
	OK09634	72	-
	OK09935C	75	-
	OK09528	77	-
	OK09729	77	-
	OK08328	80	77
	OK09125	80	-
<hr/>			
	Average	72	65

# 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, Title IX of the Education Amendments of 1972, Americans with Disabilities Act of 1990, and other federal laws and regulations, does not discriminate on the basis of race, color, national origin, gender, age, religion, disability, or status as a veteran in any of its policies, practices, or procedures. This includes but is not limited to admissions, employment, financial aid, and educational services.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, the Director of 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 20 cents per copy. 0513 GH Revised.