



# Current Report

Cooperative Extension Service • Division of Agriculture • Oklahoma State University

## WHEAT FORAGE YIELDS

### FALL AND WINTER

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Wheat grown in Oklahoma is frequently used for both forage and grain. In the wheat grain/stocker cattle production system, one of the limitations is forage availability during December, January, and early February prior to the wheat breaking dormancy. This report summarizes results from eight wheat variety trials where forage data were collected by clipping and are expressed in pounds of dry matter per acre. Forage yields were separated into fall forage (all forage produced prior to mid-December), winter forage (forage produced between December and the early joint stage when the growing point or heads reach the soil surface), and total forage which was fall plus winter forage. Variety forage yields for the entire growing season were reported separately (CR 2103 Forage Production from Small Grains - 1988).

**Production practices** used on these trials were designed to maximize return per acre from the combination of forage and grain. Wheat was seeded in early September at 1,500,000 seeds per acre or approximately 90 pounds/acre. Nitrogen fertilization was managed on a nitrogen balance approach. Initially enough nitrogen was applied to meet the grain yield goal for the location. Nitrogen applied = grain yield goal multiplied by 2 pounds of N per bushel of grain - nitrogen present in the surface soil and subsoil. In January nitrogen was added to replace nitrogen already removed by the forage and

that projected to be removed by forage produced between January and the early joint stage. We assumed forage removes 30 pounds of nitrogen per 1,000 pounds of forage.

Fall forage production is influenced by planting date, soil moisture plus rainfall, variety, temperature, and pests. No attempt was made in these trials to control diseases, but greenbug populations were monitored closely and several of the trials were sprayed for greenbug control. The trials were planted as soon after September 1 as soil moisture was adequate for a good stand. Rainfall for each trial is reported in the following table. The highest fall forage yields occurred in years where good surface and subsoil moisture were present at planting and there was good rainfall in September through November (Purcell and Cherokee 1987). In contrast very low fall forage yields occurred when there was adequate moisture to obtain a stand but little precipitation from September to November (Buffalo 1989).

**Forage yields** are presented in separate tables for fall, winter, and total forage until early joint stage. Yields are presented by location for each year a trial was conducted at that location. Finally, the forage yield of a variety is presented as a percent of the yield of Chisholm grown at the same year and location combination. This allows us to compare varieties to a constant check variety and make

meaningful comparisons when all varieties do not appear in all years.

**Fall forage yields** ranged from an average of 135 lb/acre at Buffalo in 1989 to over 2,000 lb/acre at both Cherokee and Purcell in 1987. Even with this range in average yield, the high yielding varieties were consistently high. For example Agripro Victory, Agripro Wrangler, Agripro Thunderbird, Pioneer 2180, Pioneer 2157, and Agripro Stallion in a total of 40 observations were below the location average only six times. In conclusion, varieties can be classified as high, low or intermediate fall forage producers.

Compared to fall forage, winter forage yields were generally lower and varietal performance more inconsistent. Varietal performance across locations were so inconsistent that when all 1988 and 1989 locations are evaluated together there is no statistically significant difference among varieties for winter forage production.

Total forage production at most locations paralleled fall forage production. Usually fall forage yields were much higher

than winter forage yields. Varietal yield differences were much larger in fall forage than in either winter forage or total forage.

**When selecting wheat varieties** to be grown for forage as well as grain yield, select a group of varieties with desirable grain yield capability, then determine their fall forage production capability. The emphasis should be placed on fall forage capability because fall forage production level limits the stocking rate used for winter grazing. Also, the largest, most consistent varietal differences in forage yield have been in fall production.

LSD's (least significant difference) are presented in the tables. LSD is a statistical test of yield differences. If the LSD number listed is greater than the yield difference between two varieties, we cannot be confident there is any difference in yield.

These data result from a cooperative effort between several individual wheat growers, The Oklahoma Agricultural Experiment Station, The Cooperative Extension Service, and The Oklahoma Wheat Commission.

**RAINFALL DATA FOR WHEAT FORAGE VARIETY TRIALS**

Month	1987-88		1988-89			1989-90		
	Cherokee	Purcell	Cherokee	Purcell	Retrop	Buffalo	Marshall	Purcell
	----- inches -----							
August	2.35	1.08	0.00	1.54	1.04	5.94	5.95	0.55
September	7.44	5.27	1.56	7.18	0.21	2.76	1.73	4.50
October	0.65	2.58	2.32	3.09	3.67	0.28	2.63	2.28
November	0.95	0.95	1.30	0.85	4.68	0.00	0.30	0.70
December	1.74	4.63	0.20	2.13	0.68	0.29	0.49	0.23
<b>Fall total</b>	<b>13.13</b>	<b>14.51</b>	<b>5.38</b>	<b>14.79</b>	<b>10.28</b>	<b>9.27</b>	<b>11.10</b>	<b>8.26</b>
January	1.00	1.68	1.17	1.96	1.44	0.43	0.99	2.34
February	0.00	0.38	0.87	3.40	1.18	1.48	1.82	2.61
March	1.50	3.74	3.25	2.11	1.56	1.01	3.23	6.08
<b>Total</b>	<b>15.63</b>	<b>20.31</b>	<b>10.67</b>	<b>22.26</b>	<b>14.46</b>	<b>12.19</b>	<b>17.14</b>	<b>19.29</b>

FALL FORAGE<sup>1</sup> YIELD FOR HARD WINTER WHEAT VARIETIES.

BRAND	ENTRY	CHEROKEE		PURCELL			RETROP	BUFFALO	MARSHALL	% OF CHISHOLM <sup>2</sup>
		1987	1988	1987	1988	1989	1987	1989	1989	
		-----lb/acre-----								
AGRIPRO	VICTORY	2893	1493	2926	1285	-	866	-	-	175
AGRIPRO	WRANGLER	2532	974	3010	1585	-	871	-	-	166
PIONEER	2180	-	774	-	1197	1062	835	288	1355	147
PIONEER	2157	1964	643	2966	1157	1069	717	559	1069	142
AGRIPRO	THUNDERBIRD	2567	979	3282	921	959	636	189	596	142
AGRIPRO	STALLION	2115	1102	2702	1210	989	584	103	1231	140
---	ARKAN	2458	641	2869	913	849	817	273	1128	139
PIONEER	2172	2160	646	2691	987	-	544	-	-	130
---	SIOUXLAND	2636	713	2564	661	845	633	61	824	125
AGSECO	7837	2040	765	2236	950	-	702	-	-	124
---	CENTURY	2249	810	2640	909	606	588	20	577	118
---	CODY	1612	673	2802	501	-	755	-	-	118
AGRIPRO	ABILENE	2348	563	2279	725	698	457	36	976	113
---	KARL	-	709	-	946	823	597	130	921	110
---	TAM 200	2359	342	2470	631	603	389	90	698	106
AGRIPRO	MESA	2132	557	2555	668	427	620	35	529	105
---	PONY	1750	982	2247	355	-	255	-	-	104
---	CHISHOLM	1371	723	2037	798	767	468	102	881	100
QUANTUM	574	-	-	-	-	851	-	68	782	97
AGSECO	7846	1819	370	2067	440	587	463	81	911	94
---	TAM W-101	1958	329	2188	328	480	431	49	654	90
---	ARAPAHOE	-	-	-	-	385	-	39	190	35
AGRIPRO	SIERRA	-	-	-	-	284	-	14	193	28
	MEAN	2164	701	2596	858	723	611	135	795	
	LSD (.05)	686	268	608	202	183	250	119	416	

<sup>1</sup>Fall forage is forage produced prior to mid-December or the dormant period.

<sup>2</sup>Forage yield expressed as a percent of the yield of Chisholm grown in the same environments.

WINTER FORAGE<sup>1</sup> YIELD OF HARD WINTER WHEAT VARIETIES.

BRAND	ENTRY	CHEROKEE		PURCELL			RETROP	BUFFALO	MARSHALL	% of Chisholm <sup>2</sup>
		1988	1989	1988	1989	1990	1988	1990	1990	
-----lb/acre-----										
AGRIPRO	SIERRA	-	-	-	-	1038	-	762	334	144
PIONEER	2180	-	498	-	590	877	554	939	735	131
AGRIPRO	MESA	874	409	366	955	822	402	1059	612	126
---	TAM 200	1134	434	325	786	830	454	777	561	122
---	TAM W-101	966	397	443	694	870	381	950	558	121
---	KARL	-	634	-	615	603	524	848	617	120
---	ARKAN	800	298	412	781	699	505	951	626	117
QUANTUM	574	-	-	-	-	624	-	670	401	114
PIONEER	2157	757	434	386	687	553	572	998	452	111
AGSECO	7837	1160	454	387	650	-	514	-	-	110
---	SIOUXLAND	762	661	262	446	562	628	880	499	108
AGSECO	7846	729	666	166	837	542	470	891	394	108
---	ARAPAHOE	-	-	-	-	586	-	675	319	107
AGRIPRO	THUNDERBIRD	769	541	229	507	469	703	833	428	103
---	CHISHOLM	906	606	244	703	410	411	811	262	100
PIONEER	2172	721	600	376	555	-	559	-	-	98
AGRIPRO	WRANGLER	721	724	256	601	-	491	-	-	97
---	PONY	732	438	487	678	-	393	-	-	95
AGRIPRO	STALLION	636	397	363	659	637	384	721	277	94
---	CODY	633	597	258	673	-	495	-	-	93
AGRIPRO	ABILENE	662	556	195	544	517	434	722	440	93
AGRIPRO	VICTORY	667	572	281	512	-	407	-	-	85
---	CENTURY	553	412	203	536	433	403	488	347	78
MEAN		788	516	306	650	651	484	860	463	
LSD (.05)		236	196	180	193	224	122	169	147	

<sup>1</sup>Winter forage is forage produced after dormancy until early joint stage.

<sup>2</sup>Winter forage yield expressed as percent of the yield of Chisholm grown in the same environments.

TOTAL FORAGE PRODUCED PRIOR TO EARLY JOINT STAGE FOR HARD WINTER WHEAT VARIETIES.

BRAND	ENTRY	CHEROKEE		PURCELL			RETROP	BUFFALO	MARSHALL	% of CHISHOLM <sup>1</sup>
		1988	1989	1988	1989	1990	1989	1990	1990	
-----lb/acre-----										
AGRIPRO	VICTORY	3560	2066	3207	1797	-	1273	-	-	144
AGRIPRO	WRANGLER	3253	1699	3266	2186	-	1362	-	-	142
PIONEER	2180	-	1272	-	1787	1939	1389	1228	2090	140
---	ARKAN	3258	940	3281	1694	1549	1321	1224	1754	131
PIONEER	2157	2721	1076	3352	1844	1623	1288	1557	1521	130
AGRIPRO	THUNDERBIRD	3336	1520	3511	1428	1429	1339	1023	1024	127
AGRIPRO	STALLION	2750	1499	3065	1869	1627	969	824	1508	123
PIONEER	2172	2881	1246	3067	1542	-	1103	-	-	119
AGSECO	7837	3199	1219	2623	1600	-	1216	-	-	119
---	SIOUXLAND	3398	1374	2826	1107	1407	1262	941	1323	118
---	KARL	-	1344	-	1561	1427	1121	979	1538	115
AGRIPRO	MESA	3006	966	2921	1623	1249	1022	1094	1142	113
---	TAM 200	3493	776	2795	1417	1433	844	867	1258	112
---	CODY	2245	1270	3060	1174	-	1250	-	-	109
AGRIPRO	ABILENE	3010	1119	2474	1269	1215	891	758	1416	106
QUANTUM	574	-	-	-	-	1475	-	739	1183	105
---	CENTURY	2802	1222	2843	1445	1040	991	508	924	102
---	TAM W-101	2924	726	2631	1022	1350	812	999	1212	102
---	CHISHOLM	2276	1329	2281	1501	1177	880	913	1144	100
AGSECO	7846	2548	1036	2233	1277	1129	932	972	1305	99
---	PONY	2483	652	2734	1033	-	648	-	-	91
AGRIPRO	SIERRA	-	-	-	-	1322	-	777	527	81
---	ARAPAHOE	-	-	-	-	972	-	714	509	68
MEAN		2952	1217	2898	1509	1374	1096	995	1258	
LSD (.05)		673	386	712	287	319	266	244	452	

<sup>1</sup>Total forage yield expressed as a percent of the yield of Chisholm grown in the same environments.

## SUMMARY OF VARIETY EVALUATIONS

Producers have different priorities depending upon their intended use of a wheat crop. The following summary separates varieties into those which have done well in grain trials (for performance data see CR-2241 Performance of Wheat Varieties in Oklahoma-1989), fall forage production, and those which appear to be best suited for the combination of forage and grain from the same planting.

### VARIETIES PERFORMING WELL IN GRAIN TRIALS

AGRIPRO ABILENE	CHISHOLM
AGRIPRO MESA	PIONEER 2157
AGRIPRO STALLION	TAM 200
AGSECO 7846	

### VARIETIES PERFORMING WELL IN FALL FORAGE TRIALS

AGRIPRO STALLION	AGRIPRO WRANGLER
AGRIPRO THUNDERBIRD	ARKAN
AGRIPRO VICTORY	PIONEER 2157

### VARIETIES PERFORMING WELL FOR BOTH FORAGE AND GRAIN

AGRIPRO STALLION	PIONEER 2157
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### VARIETIES NOT ADEQUATELY TESTED

CIMARRON	PIONEER 2180
KARL	



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