

WHEAT, RYE, AND OAT FORAGE YIELDS AT OVERTON FOR 2002-2003 AND 3-YEAR MEAN

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Summary and Application

This report provides forage yields for wheat, rye and oat experiments for 2002-2003 and gives a 3-year mean yield for some commercial varieties. When comparing varieties, a 3-year mean should be much more useful because one year's data may be affected by environmental conditions.

Introduction

Small grains are often utilized for grazing by cattlemen during the cool season in Texas. The small grains which are usually used for grazing are wheat, rye and oats. Each of these crops may have some advantage over another small grain and fit into a grazing operation. For example, rye has good seedling vigor and is very winter hardy. Oats has less winter freeze resistance, but has very high forage yield potential in the spring. Wheat is often utilized as a dual purpose (forage and grain) crop wherever wheat is grown for grain. These crops may also have some negative traits. For example, rye matures in April and has little late spring forage production. Initiation of stems occurs with rye as early as mid-March and both digestibility and crude protein content of the forage can decline rapidly. Oats are fairly susceptible to freeze damage and may be susceptible to crown rust. Wheat generally has lower total season forage yields compared to the other two crops. There are significant differences between varieties and over years. Some varieties produce more forage in the fall while others produce higher yields in the

winter or spring.

Methods and Materials

Wheat, rye and oat forage variety tests are conducted annually at the TAMU Agricultural Research and Extension Center at Overton. Commercial varieties and experimental lines were evaluated during the past 3 years. Fertilizer application rates and dates for the 2002-03 study are noted in the Tables 1, 2 and 3. Planting dates were early September normally; however, in 2002, the planting date was 13 September. Seed were drilled into a prepared seedbed at a 1-inch depth at 110 lb/ac. Seed were drilled in 7 rows spaced 6 inches apart. Plot size was 4 x 12 ft with four replications. The plots were harvested with a Hege plot harvester (Fig. 1) at a cutting height of 2 inches on the dates noted of each table for a specific small grain. Forage was harvested whenever forage was about 8 inches in height.



Figure 1. Hege forage harvester in plot of small grains.

Results and Discussion

Environmental conditions greatly affect

forage production of all small grain crops. Rainfall in inches by months was Sept., 3.8; Oct., 3.2; Nov., 3.0; Dec., 10.3; Jan., 0.7; Feb., 7.7; Mar., 1.2; Apr., 1.7; and no rainfall early in May. These rainfall amounts indicated moisture stress in January and in March, April and May. The coldest temperature was 21⁰F on 24 January; however, we did not observe any freeze damage.

In the rye experiment (Table 1), forage production was average in fall and early winter. The first harvest on 16 November resulted in a range of yields from 743 to 2110 lb/ac. The high yield was produced by FL Bates Selection, an experimental line from Florida, which was selected out of 'Bates' rye. It produced high forage yields early in the season. The second harvest on 6 January resulted in good yields for this mid-winter period. In the third harvest on 11 February, the rye had poor growth and most entries produced low forage yields. This was primarily due to lack of moisture in January and cool temperatures. In the 4th harvest on 10 March, better yields were recorded with a range from 463 to 1182 lb/ac. In the fifth harvest on 4 April, below average forage yields were recorded. This is the time of year where very high forage yields should be observed. In the 5th harvest several varieties such as 'Elbon', 'Maton', 'Oklon', and 'Wintermore', did produce over 2000 lb dry matter per acre. The last harvest on 13 May was primarily stems and seed heads and very low dry matter yields were recorded. The bottom three entries in Table 1 are two experimental triticale lines and one wheat line. These experimental lines did not produce competitive forage yields compared to most of the rye entries. For the total season dry matter yields, little differences were noted between varieties; however, Oklon, Bates, 'Wintergrazer 70' and Maton were near the top of the forage

yield trial. For the four varieties tested over the past 3 years, Maton had a slight advantage for forage yield.

In the oat experiment (Table 2), good fall production occurred. The higher yielding varieties were '811', 'Horizon 474', 'TAM 397' and 'Chapman', which all yielded over a ton dry matter per acre on the 6 November harvest. In the second harvest on 11 February, yields were good, with a range from 743 to 1549 lb/ac between entries. In the 17 March harvest good forage production resulted; however, little variation between entries was apparent. The 4th harvest was on 13 April, and as earlier harvests, good yields were produced. The highest yielding commercial entry was 'Heavy Grazer 76-30'. In the last harvest on 13 May, very low yields were recorded due to dry moisture conditions which reduced late season forage yields of oats. For the total season dry matter yield 'Secretariat 495' produced the highest yield; however, it was not significantly better than several other entries. For the 3-year mean yields, 'Dallas' had the highest yield and it produced 562 lb/ac more than Heavy Grazer 76-30. There was no freeze damage in this experiment in 2003. Winterkill can be a serious problem with oat in Texas. In past years, TAMO 397 had the highest freeze damage rating and Dallas was more freeze tolerant. TAMO 397 is not recommended to be grown north of Waco as it has been winterkilled at Overton and in North Texas.

In the wheat experiment (Table 3), fall and winter production was above average. Moisture was adequate in September and October which allowed good fall growth. The first harvest was on 7 November. Higher yielding varieties were 'Lockett', a hard red winter wheat, and 'Natchez' a soft wheat. In the 11 February harvest, forage yields were average. The dry conditions in

January delayed this harvest until February. Higher yielding varieties were Natchez followed by several experimental lines. In the 3rd harvest on 10 March, yields were below average. Lockett produced the higher yield, again followed by several experimental lines. On the fourth harvest on 26 March, good yields were produced considering it was only 16 days from the previous harvest. 'Savage', Lockett and 'Roane' produced higher yields. In the last harvest on 29 April dry matter was primarily stems and seed heads and average yields were produced. 'Pioneer 25R57' and Roane produced the higher forage yields. For the total season yield, the experimental HBB-362-7 had the higher yield but it was not significantly better than Natchez, Savage, Pioneer 25R57, or Lockett. For the five entries tested over the past 3 years, little differences are apparent; however, 'Coker 9803' produced lower a yield than the other varieties.

Data presented from these trials should be useful in selecting small grain varieties for your ranch. Depending on variety

availability, compare forage yields to determine which variety you want to plant. Rye will usually out produce wheat for forage production, however, rye seed is often scarce and expensive. Therefore wheat is an attractive alternative. Oats may produce high forage yields if no winterkill occurs, however, it is at higher risk than rye or wheat. Ryegrass forage yields are published elsewhere on this website. Ryegrass can also be seeded with wheat, oats, or rye. Total season forage production may be increased as well as extending the production of high quality forage into late May.

Conclusion

Over the past 3 years in rye forage trials at Overton, Maton rye produced highest yields followed by Oklon, Elbon, and Bates. In oat trials, Dallas oat has produced highest yields over three years. In wheat forage trials, Pioneer 25R57, Pioneer 25R78, and Roane were the highest yielding varieties. No winter killing occurred in 2003 due to a relatively warm winter.

Table 1. Rye forage yields at Overton, Texas for 2002-2003.

Variety	Harvest t 1 Nov. 16	Harvest 2 Jan. 6	Harvest 3 Feb. 11	Harvest 4 Mar. 10	Harvest 5 Apr. 4	Harvest 6 May 13	Total DMY	3 Yr Mean
	-----pounds of dry matter per acre-----							
FL Bates Sel.*	2110	1511	580	791	1216	127	6335	--
Oklon	1506	972	415	1046	2085	57	6080	5123
NF 28*	1420	1565	423	976	1517	105	6006	--
SPI Rye*	1365	1149	427	1007	1907	127	5982	--
Bates	1465	1456	394	935	1620	40	5910	4843
Wintergrazer 70	1591	1198	364	754	1857	81	5843	--
Maton	1411	722	253	1028	2249	30	5693	5579
FPL97P20*	1106	1738	296	1070	1237	176	5622	--
Wintermore	1417	806	201	951	2168	32	5573	--
WR 2001*	1278	819	123	1043	2185	47	5493	--
Elbon	1112	603	174	1182	2319	34	5423	4932
NF 65*	1256	1131	363	982	1503	96	5331	5331
NF 1*	1248	1221	193	756	1681	122	5221	4992
FLNF94 Sel.*	813	891	429	715	1526	103	4475	--
Wintermaster II	932	22	66	587	1793	236	3636	--
TX94VT509*	1039	331	69	673	1346	104	3561	--
TX96UT633*	897	270	204	460	1471	237	3538	--
TX89-55FW*	743	218	22	463	1599	325	3369	--
Mean	1261	923	277	856	1738	115	5172	5064
CV	22	33	57	17	13	83	18	
LSD	252	281	146	134	206	88	873	

Planted on 13 September 2002. Fertilizer: Preplant 91 lb N, P₂O₅ and K₂O/ac. Topdressed with 40 lb N on 12 November, 33 lb N/ac on 21 January. Forty lb/ac of N, P₂O₅ and K₂O on 6 March and 40 lb N/ac on 15 April 2003.

*Experimental line, seed presently not commercially available.

Table 2. Oat forage variety test at Overton, Texas for 2002-2003.

Variety	Harvest 1 Nov. 6	Harvest 2 Feb. 11	Harvest 3 Mar. 17	Harvest 4 Apr. 13	Harvest 5 May 13	Total DMY	3 Yr Mean
-----pounds of dry matter per acre-----							
Secretariat 495	1934	1549	1215	1538	463	6699	--
TAMO 397	2195	980	1501	1529	327	6532	5167
TX96D093*	1826	987	1506	1795	261	6374	--
Horizon 474	2237	1302	1139	1460	221	6358	--
Chapman	2190	1097	1146	1401	275	6109	5166
TX01CSRH Sell*	2056	881	1414	1511	217	6078	--
811	2392	743	1108	1567	128	5937	--
Dallas	1847	1035	1164	1476	361	5882	5881
Horizon 314	1992	1270	1306	1182	125	5875	5107
FL9708-P37*	1955	969	1024	1332	416	5697	--
Heavy Grazer 76-30	1847	743	1162	1746	190	5687	5319
Harrison	1732	812	1248	1401	231	5424	--
Mean	2017	1031	1244	1495	268	6054	5393
CV	14	23	19	15	81	9	
LSD (10%)	259	216	216	206	200	495	

Planted on 13 September 2002. Fertilization: Preplant 91 lb/ac of N, P₂O₅ and K₂O 9 September 2002. Topdressed with 40 lb N on 12 November, 33 lb N/ac on 21 January, 40 lb/ac of N, P₂O₅ and K₂O on 6 March and 40 lb N/ac on 15 April 2003.

*Experimental line, seed presently not commercially available.

Table 3. Wheat forage variety test at Overton, Texas for 2002-2003.

Variety	Harvest 1	Harvest 2	Harvest 3	Harvest 4	Harvest 5	Total DMY	3 Yr Mean
	Nov. 7	Feb. 11	Mar. 10	Mar. 26	Apr. 29		
-----pounds of dry matter per acre-----							
HBB-362-7*	1659	1855	1040	571	842	5966	--
Natchez	1814	2068	872	626	560	5940	--
Savage	1594	1250	680	1301	926	5751	--
Pioneer 25R57	1367	1086	958	816	1306	5532	5515
Lockett	2007	880	1137	1023	325	5329	--
Roane	1272	1182	868	1021	963	5262	5305
TX95-24-1*	1551	1710	897	636	428	5221	--
TX98V9628*	1521	1176	1011	615	625	4947	--
TX95-38-2*	1438	1601	932	714	225	4909	--
TX98D1170*	1069	270	1375	950	1225	4889	--
TX89-81-1*	1507	1884	645	408	410	4854	--
TX95-118*	1484	1512	855	524	463	4837	--
TX95-16-1*	1236	1432	1015	534	593	4800	--
Coker 9184	1361	1219	836	457	861	4733	--
TX00D1626*	1308	1599	856	764	205	4731	--
Pioneer 25R78	1067	1455	927	722	559	4730	5515
Roberts	1049	1475	758	579	822	4682	--
TX97-172*	1331	1132	1011	661	472	4606	--
Sisson	891	1336	779	754	807	4566	5361
Above	1404	1178	1069	749	162	4561	--
AP502CL*	1366	912	1147	621	461	4494	--
TAM 202	1375	1124	1013	532	348	4392	--
TX95-115*	1500	1110	904	410	460	4383	--
TX95-33-1*	1212	1466	845	687	151	4360	--
Coker 9803	1073	1657	712	578	322	4324	4793
TX94-82-4*	1422	796	837	660	592	4305	--
9918618*	1298	1705	693	478	116	4289	--
TX99A0155*	1149	900	855	765	578	4247	--
01M5009*	959	1206	980	540	545	4229	--
TAM 110	1403	906	1091	536	284	4219	--
Sturdy 2K	1267	635	960	746	468	4076	--
TX96D1073*	1349	902	982	667	176	4075	--
McCormick	793	1029	799	493	845	3959	--
TAM 111	1049	632	996	724	368	3768	--
Mean	1328	1243	921	672	544	4705	5038
CV	26	33	22	23	47	16	--
LSD	311	375	188	144	231	693	--

Planted on 13 September 2002. Fertilizer: Preplant 91 lb N, P₂O₅ and K₂O/ac. Topdressed with 40 lb N on 12 November, 33 lb N/ac on 21 January. Forty lb/ac of N, P₂O₅ and K₂O on 6 March and 40 lb N/ac on 15 April 2003.

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