

2000–2001

Forage Yields
from

**Rye,
Oat,
Wheat,
and
Triticale**
Varieties and Strains

Jerry L. Baker

The Samuel Roberts Noble Foundation, Inc.

P. O. Box 2180

Ardmore, Oklahoma 73402

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Discussion

Small-grain varieties were planted at the Noble Foundation Headquarters Farm near Ardmore and the Red River Demonstration and Research Farm near Burneyville (tables 1 and 2). The crops started slowly, since soils were dry through mid-October. The first measurable precipitation came on October 20, and stands emerged around November 1 at both locations. High rainfall and low temperatures during November and December stunted early growth and delayed development of the crops. First forage harvests were delayed until early March at both locations. Low disease pressure, mild temperatures, and adequate moisture prevailed throughout the spring, resulting in excellent spring growth and forage production. At the Ardmore location, some preplant nitrogen may have been lost by leaching through the soil profile because of the heavy rainfall in late October and November. Therefore, additional nitrogen was applied in early December to stimulate growth.

At the **Ardmore** Headquarters Farm, the test plots were planted at a new site on a Heiden clay soil. The test plants were harvested four times for forage yield during the spring phase of the growing season (table 1). Despite the slow start and lack of fall and early winter forage growth, the total forage yields averaged 3,969 pounds per acre for the test. Note that almost 40 percent of the total forage was harvested on March 16. Muddy fields delayed the first harvest by seven to ten days, resulting in additional forage accumulation before clipping was initiated. The ryes were the earliest forage producers and oats were the latest. On average, the ryes yielded 57 percent of their forage by the first clipping; wheats, triticales, and oats yielded 40, 38, and 7 percent, respectively, which illustrates rye's ability to grow better under colder conditions than the other small grains. In general, the triticale varieties yielded the most forage in this year's trial. Eight of the top fifteen producers were triticales.

At **Burneyville**, soils remained extremely dry through September and much of October, forcing late planting and stand emergence. Low temperatures during November and December stunted crops and delayed their development. However, excellent moisture and mild temperatures resulted in excellent late winter and spring forage growth.

Despite the lack of early forage production, the trial averaged a respectable 4,688 pounds of dry forage per acre (table 2). Forage was harvested four times during the late-winter and spring phase of the growing season. Only 19 percent of all forage was harvested by March 6. Again, the ryes were the earliest and most productive throughout most of the growing season. Note that eleven of the top twenty forage yielders were ryes. Most of the wheat and triticale varieties provided excellent midspring forage. Oats yielded forage the latest.

For Ardmore and Burneyville, respectively, tables 3 and 4 summarize the total forage yields of commercially available small-grain crop varieties that have been tested the last three years. Our emphasis was to evaluate the forage production potential of crops and varieties that are available in southern central Oklahoma and northern Texas.

When studying the data, producers should look for the consistency and dependability of crop performance, a variety, or both across multiple years rather than within individual years. Notice that total rye and oat production (table 3) at **Ardmore** has been comparable throughout the last three seasons, the primary difference being that the ryes have consistently been the earliest forage producers and oats the latest. Overall, the wheats have been good late-winter and midspring forage producers but have been the lowest total forage yielders throughout the three-year period. At **Burneyville**, forage production has historically been more favorable for ryes throughout the years. Note that rye has the highest three-year average (table 4), although the oat varieties produced substantially more total forage in the 1998–1999 season. As a group, the wheat varieties have yielded the least each year on this sandy loam site.

‘Bates’ has been the most consistent and stable rye variety throughout the past three seasons at both Ardmore and Burneyville. ‘Maton’, an older rye variety, continues to perform well at both locations, but ‘Oklon’ yields have declined throughout the past three seasons. The early fall forage advantage of ‘Oklon’ was not as evident in 1998–1999 and 1999–2000, when mild temperatures prevailed throughout the growing seasons. This past season, growth and development of forage in the fall and early winter was essentially nonexistent because of the late plantings and cold temperatures in November and December. Therefore, the earliness advantage may also have been negated.

‘Harrison’ oat has been the most consistent throughout the three years of testing on the heavier soils at Ardmore. However, on sandy loam soil at Burneyville, it has been the least stable of the oat varieties. Forage productivity among the other oat varieties at both locations was inconsistent and unstable.

From 1997–2000, an awnless soft wheat variety called ‘Coker 9663’ consistently outyielded the hard wheats at both locations. This season it again performed well at Ardmore, but its yield fell dramatically at Burneyville. ‘Lockett’, a dual-purpose hard wheat variety, continues to perform moderately well at both locations. It appears to be an excellent graze-out wheat because it is awnless and produces good spring forage. ‘Jagger’, an excellent grain type and an early forage producer, made a comeback this year after exhibiting declining yields in the three previous years of testing. ‘Tam 202’ has been a moderately good forage wheat at Burneyville but not Ardmore, whereas ‘Tonkawa’ performed moderately well at Ardmore but not Burneyville.

‘Danko Presto’ triticale consistently produces good spring forage but does not yield much fall or early winter forage.

Table 1. Small-grain forage performance, 2000–2001; Headquarters Farm, Ardmore, Oklahoma¹

Variety or Strain ²	Clipping Dates				2000– 2001 Total	Elbon (%)	Forage Produced by 3/16 (%)
	3/16	4/10	5/3	5/25			
	Pounds of oven-dry forage per acre						
TX 96D093 oat	685	2,648	1,117	253	4,703	116	15
NF 188 oat	481	2,602	1,118	365	4,566	113	11
Wrens 96 rye	3,246	728	534	0	4,508	112	72
Ozark oat	392	2,266	1,488	279	4,426	110	9
RSI 346 triticale	678	2,646	1,098	0	4,422	110	15
NF 87 triticale	2,252	1,958	181	0	4,391	109	51
Winterking rye	2,138	1,791	413	0	4,343	108	49
Maton rye	1,955	1,922	459	0	4,336	107	45
RSI 1029E triticale	2,053	2,096	185	0	4,333	107	47
RSI L989 triticale	1,712	2,372	244	0	4,327	107	40
Danko Presto triticale	984	2,826	462	0	4,272	106	23
TX 96VT5019 triticale	1,933	2,033	303	0	4,270	106	45
La. 604 oat	201	2,077	1,165	795	4,238	105	5
TX 98D955 triticale	2,165	1,654	397	0	4,216	104	51
RSI 10207 triticale	1,652	2,224	338	0	4,214	104	39
XB 9916 (trit-rye blend)	1,448	2,397	362	0	4,206	104	34
NF 39 rye	2,657	1,072	464	0	4,193	104	63
Harrison oat	344	2,092	1,337	413	4,187	104	8
NF 4 wheat	2,001	1,900	284	0	4,185	104	48
Jagger wheat	1,431	2,615	96	0	4,142	103	35
Coker 9663 wheat (soft)	1,556	2,144	427	0	4,127	102	38
NF 28 rye	2,748	946	411	0	4,104	102	67
NF 1 rye	2,797	942	355	0	4,095	101	68
XR 9907 rye	2,190	1,567	320	0	4,077	101	54
XR 9908 rye	2,056	1,642	357	0	4,055	100	51
NF 65 rye	2,677	1,000	376	0	4,053	100	66
XR 9905 rye	2,297	1,480	273	0	4,051	100	57
OK 101 wheat	1,806	2,140	93	0	4,039	100	45
Elbon rye	1,470	2,031	537	0	4,038	100	36
Lockett wheat	1,345	2,574	71	0	3,990	99	34
Bates (RS1) rye	2,580	860	537	0	3,977	98	65
Bates (RS2) rye	2,845	745	354	0	3,944	98	72
Bates rye	2,222	1,278	416	0	3,916	97	57
TX 94D081 oat	203	2,241	1,210	261	3,916	97	5
TX 94D7575 triticale	1,477	2,203	233	0	3,913	97	38
Bates (RS3) rye	2,336	1,132	427	0	3,896	96	60
NF 165 wheat	2,063	1,632	183	0	3,879	96	53
XB 9917 (trit-rye blend)	1,341	1,964	566	0	3,871	96	35
Tonkawa wheat	1,382	2,401	86	0	3,870	96	36
2137 wheat	1,293	2,495	54	0	3,841	95	34
XR 9909 rye	2,312	1,240	280	0	3,832	95	60
Oklon rye	2,510	979	316	0	3,805	94	66
Horizon 314 oat	341	2,041	921	443	3,746	93	9
833 oat	160	1,612	1,558	374	3,703	92	4
Dallas oat	21	1,630	1,748	293	3,692	91	1
XR 9903 rye	1,906	1,317	467	0	3,690	91	52
Custer wheat	1,349	2,276	53	0	3,678	91	37
TX 98D137 oat	133	2,446	844	218	3,641	90	4
Tam 202 wheat	1,837	1,571	184	0	3,593	89	51
Tomahawk wheat	1,194	2,234	146	0	3,573	88	33

2174 wheat	1,142	2,349	57	0	3,548	88	32
TX 96D070 oat	341	2,033	900	250	3,524	87	10
Coker 9704 wheat (soft)	1,357	1,867	109	0	3,333	83	41
Longhorn wheat	1,509	1,762	48	0	3,319	82	45
Coronado wheat	1,105	2,081	96	0	3,282	81	34
Coker 9803 wheat (soft)	1,163	1,832	167	0	3,162	78	37
TX 96D011 oat	41	829	1,514	576	2,961	73	1
Average							
	1,535	1,850	504	79	3,969	98	39
L. S. D. ³ (.05)							
	606	485	324	119	629		
C. V. ⁴ (%)							
	24.4	16.2	39.7	92.5	9.8		

¹Planting date: October 3, 2000 (dry-seeded).

Seeding rate: 2,000,000 live seed per acre, which approximates 90–120 pounds per acre, depending on variety.

Seeding method: Drilled in 7-inch rows at a 1-inch planting depth.

Replications: Three.

Soil type: Heiden clay.

Previous crop: Wheat.

Management: Disked and roller-harrowed.

Weed control: Preemergence—0.56 ounces of Amber per acre on October 6, 2000.

Fertilization: Preplant—160 pounds of N and 70 pounds of P₂O₅ per acre on September 14, 2000; top-dress—50 pounds of N per acre on December 8, 2000, and 70 pounds of N per acre on February 5, 2001.

²NF numbers are Noble Foundation experimental strains. XB and XR numbers are experimental blends developed by Seed Resource. TX numbers are Texas A&M University experimental strains. RSI numbers are experimentals developed by Resource Seeds, Inc. Seed of this experimental material are not commercially available.

³Least significant difference.

⁴Coefficient of variation.

Table 2. Small-grain forage performance, 2000–2001; Red River Demonstration and Research Farm, Burneyville, Oklahoma¹

Variety or Strain ²	Clipping Dates				2000– 2001 Total	Elbon (%)	Forage Produced by 3/6 (%)
	3/6	4/2	4/24	5/17			
	Pounds of oven-dry forage per acre						
RSI 1029E triticale	1,406	3,720	635	0	5,761	120	24
Bates rye	1,922	2,976	739	0	5,636	117	34
XR 9905 rye	1,624	3,545	433	0	5,602	116	29
XB 9916 (trit-rye blend)	922	3,739	922	0	5,583	116	17
NF 65 rye	2,230	2,960	366	0	5,556	115	40
Custer wheat	651	4,090	795	0	5,537	115	12
Bates (RS1) rye	1,856	3,031	543	0	5,430	113	34
NF 28 rye	1,843	3,009	418	0	5,270	110	35
NF 188 oat	145	2,248	2,481	282	5,156	107	3
XR 9908 rye	1,794	2,898	446	0	5,138	107	35
Maton rye	558	4,064	498	0	5,119	106	11
XR 9907 rye	1,687	3,063	336	0	5,086	106	33
XB 9917 (trit-rye blend)	966	3,244	871	0	5,081	106	19
NF 1 rye	1,562	2,993	520	0	5,075	105	31
Bates (RS2) rye	2,206	2,338	499	0	5,043	105	44
Bates (RS3) rye	1,952	2,533	512	0	4,997	104	39
Danko Presto triticale	324	3,473	1,174	0	4,971	103	7
NF 87 triticale	878	3,319	747	0	4,944	103	18
OK 101 wheat	1,011	3,352	574	0	4,937	103	20
Ozark oat	241	2,570	2,022	86	4,920	102	5
Lockett wheat	729	3,236	937	0	4,902	102	15
Oklon rye	1,937	2,477	443	0	4,857	101	40
XR 9909 rye	1,407	3,122	320	0	4,848	101	29
TX 96D011 oat	90	1,677	2,641	436	4,845	101	2
NF 4 wheat	938	3,290	586	0	4,814	100	19
Elbon rye	1,140	3,364	307	0	4,812	100	24
NF 39 rye	1,577	2,805	424	0	4,805	100	33
XR 9903 rye	1,700	2,591	497	0	4,788	100	36
Winterking rye	844	3,477	432	0	4,753	99	18
RSI L989 triticale	656	2,986	1,037	0	4,680	97	14
TX 96D093 oat	174	2,143	1,913	440	4,671	97	4
NF 165 wheat	864	3,202	600	0	4,666	97	19
RSI 346 triticale	54	2,446	2,162	0	4,663	97	1
833 oat	142	2,171	2,046	223	4,581	95	3
Coronado wheat	780	3,147	648	0	4,576	95	17
Wrens 96 rye	1,947	2,110	483	0	4,540	94	43
Jagger wheat	646	3,100	718	0	4,464	93	14
2137 wheat	400	3,265	785	0	4,450	92	9
Horizon 314 oat	176	1,885	1,857	518	4,436	92	4
Tonkawa wheat	494	3,120	809	0	4,423	92	11
Tam 202 wheat	900	2,966	525	0	4,390	91	21
La. 604 oat	64	1,553	2,329	382	4,328	90	1
Dallas oat	78	1,734	2,217	278	4,308	90	2
TX 96D070 oat	197	1,884	1,621	570	4,271	89	5
TX 94D7575 triticale	703	2,805	739	0	4,247	88	17
2174 wheat	528	2,919	797	0	4,244	88	12
TX 94D081 oat	65	1,668	1,980	528	4,241	88	2
TX 98D955 triticale	672	2,731	785	0	4,188	87	16
Harrison oat	120	1,800	1,830	381	4,131	86	3
TX 96VT5019 triticale	791	2,527	790	0	4,108	85	19

RSI 10207 triticale	417	2,621	1,019	0	4,058	84	10
Coker 9704 wheat (soft)	683	2,869	496	0	4,048	84	17
TX 98D137 oat	109	1,796	1,787	336	4,028	84	3
Coker 9663 wheat (soft)	409	2,554	1,047	0	4,011	83	10
Longhorn wheat	615	2,543	517	0	3,675	76	17
Coker 9803 wheat (soft)	473	2,412	577	0	3,461	72	14
Tomahawk wheat	229	2,136	667	0	3,032	63	8
	Average						
	869	2,777	963	78	4,688	97	19
	L. S. D. ³ (.05)						
	589	824	284	167	949		
	C. V. ⁴ (%)						
	41.9	18.3	18.2	131.7	12.5		

¹Planting date: October 19, 2000.

Seeding rate: 2,000,000 live seed per acre, which approximates 90–120 pounds per acre, depending on variety.

Seeding method: Drilled in 7-inch rows at a 1-inch planting depth.

Replications: Three.

Soil type: Minco fine sandy loam.

Previous crop: Small grains.

Management: Disked and roller-harrowed.

Weed control: Preemergence—0.56 ounces of Amber per acre on October 19, 2000.

Fertilization: Preplant—60 pounds of K₂O per acre on September 1, 2000; top-dress—100 pounds of N per acre on November 16, 2000, and 70 pounds of N per acre on February 6, 2001.

²NF numbers are Noble Foundation experimental strains. XB and XR numbers are experimental blends developed by Seed Resource. TX numbers are Texas A&M University experimental strains. RSI numbers are experimentals developed by Resource Seeds, Inc. Seed of this experimental material are not commercially available.

³Least significant difference.

⁴Coefficient of variation.

Table 3. Forage performance summary of commercial small-grain varieties, 1998–2001; Ardmore, Oklahoma

Variety	Pounds of Oven-Dry Forage per Acre				
	1998–1999	1999–2000	2000–2001	Three-Year Avg. 1998–2001	Two-Year Avg. 1999–2001
Rye					
Bates	8,131 (1) ¹	7,224 (1)	3,916 (4)	6,424 (1)	5,570 (1)
Elbon	6,788 (5)	6,607 (4)	4,038 (3)	5,811 (5)	5,323 (4)
Maton	7,046 (4)	6,798 (2)	4,336 (2)	6,060 (3)	5,567 (2)
Oklon	7,444 (3)	5,869 (5)	3,805 (5)	5,706 (4)	4,837 (5)
Wrens 96	7,447 (2)	6,511 (3)	4,508 (1)	6,155 (2)	5,510 (3)
Average					
	7,371	6,602	4,121	6,031	5,361
Oat					
Dallas	7,643 (2)	5,904 (4)	3,692 (5)	5,746 (4)	4,798 (4)
Harrison	8,093 (1)	7,959 (1)	4,187 (3)	6,746 (1)	6,073 (1)
Horizon 314	7,383 (4)	6,492 (2)	3,746 (4)	5,874 (3)	5,119 (3)
La. 604	7,300 (5)	5,061 (5)	4,238 (2)	5,533 (5)	4,650 (5)
Ozark	7,590 (3)	6,176 (3)	4,426 (1)	6,064 (2)	5,301 (2)
Average					
	7,602	6,318	4,058	5,993	5,188
Wheat					
2137	7,157 (9)	5,539 (6)	3,841 (5)	5,513 (5)	4,690 (4)
2174	6,866 (10)	5,580 (4)	3,548 (9)	5,331 (8)	4,564 (6)
Coker 9663 (soft)	7,805 (1)	5,710 (3)	4,127 (2)	5,880 (1)	4,918 (2)
Coronado	7,349 (6)	5,253 (8)	3,282 (11)	5,294 (9)	4,267 (10)
Custer	7,494 (3)	5,403 (7)	3,678 (6)	5,525 (4)	4,541 (7)
Jagger	7,379 (5)	4,905 (10)	4,142 (1)	5,475 (6)	4,524 (8)
Lockett	7,382 (4)	5,902 (1)	3,990 (3)	5,758 (2)	4,946 (1)
Longhorn	7,217 (7)	4,805 (11)	3,319 (10)	5,114 (11)	4,062 (11)
Tam 202	7,171 (8)	5,551 (5)	3,593 (7)	5,438 (7)	4,572 (5)
Tomahawk	6,651 (11)	5,223 (9)	3,573 (8)	5,149 (10)	4,398 (9)
Tonkawa	7,509 (2)	5,713 (2)	3,870 (4)	5,697 (3)	4,791 (3)
Average					
	7,271	5,417	3,724	5,470	4,570
Triticale					
Danko Presto	8,156	5,111	4,272	5,846	4,692
Overall average					
	7,409	5,877	3,915	5,733	4,896
L. S. D. ² (.05)					
	1,060	1,098	623		

¹The number in parentheses is the rank within the column and crop.

²Least significant difference.

Table 4. Forage performance summary of commercial small-grain varieties, 1998–2001; Burneyville, Oklahoma

Variety	Pounds of Oven-Dry Forage per Acre				
	1998–1999	1999–2000	2000–2001	Three-Year Avg. 1998–2001	Two-Year Avg. 1999–2001
Rye					
Bates	7,199 (3) ¹	8,119 (1)	5,636 (1)	6,985 (1)	6,878 (1)
Elbon	7,240 (2)	7,755 (3)	4,812 (4)	6,602 (3)	6,284 (4)
Maton	7,584 (1)	7,963 (2)	5,119 (2)	6,889 (2)	6,541 (2)
Oklon	6,828 (4)	7,746 (4)	4,857 (3)	6,477 (4)	6,301 (3)
Wrens 96	6,971 (5)	7,355 (5)	4,540 (5)	6,288 (5)	5,947 (5)
Average					
	7,164	7,788	4,993	6,648	6,390
Oat					
Dallas	8,460 (2)	6,456 (1)	4,308 (4)	6,408 (1)	5,382 (1)
Harrison	8,145 (5)	5,923 (2)	4,131 (5)	6,066 (4)	5,027 (3)
Horizon 314	8,196 (4)	5,683 (3)	4,436 (2)	6,105 (3)	5,060 (2)
La. 604	9,354 (1)	4,833 (4)	4,328 (3)	6,172 (2)	4,581 (5)
Ozark	8,254 (3)	4,771 (5)	4,920 (1)	5,982 (5)	4,846 (4)
Average					
	8,482	5,533	4,425	6,147	4,979
Wheat					
2137	4,967 (11)	4,021 (11)	4,450 (5)	4,479 (11)	4,236 (9)
2174	6,573 (4)	5,271 (4)	4,244 (8)	5,362 (2)	4,757 (4)
Coker 9663 (soft)	6,667 (1)	5,289 (3)	4,011 (9)	5,322 (5)	4,650 (7)
Coronado	6,592 (3)	4,731 (7)	4,576 (3)	5,300 (6)	4,653 (6)
Custer	5,149 (10)	5,339 (2)	5,537 (1)	5,342 (4)	5,438 (1)
Jagger	6,393 (6)	4,464 (9)	4,464 (4)	5,107 (7)	4,464 (8)
Lockett	6,515 (5)	4,664 (8)	4,902 (2)	5,360 (3)	4,783 (3)
Longhorn	6,204 (7)	4,229 (10)	3,675 (10)	4,703 (9)	3,952 (11)
Tam 202	6,618 (2)	5,464 (1)	4,390 (7)	5,491 (1)	4,927 (2)
Tomahawk	5,901 (8)	4,927 (6)	3,032 (7)	4,620 (10)	3,979 (10)
Tonkawa	5,714 (9)	5,058 (5)	4,423 (11)	5,065 (8)	4,740 (5)
Average					
	6,117	4,860	4,337	5,105	4,598
Triticale					
Danko Presto	5,843	6,291	4,971	5,702	5,631
Overall average					
	6,880	5,743	4,535	5,720	5,139
L. S. D. ² (.05)					
	1,705	1,524	914		

¹The number in parentheses is the rank within the column and crop.

²Least significant difference.

Weather factors, 2000–2001

Month	Rainfall (Inches)			
	Ardmore		Burneyville	
	2000–2001 Season	Ninety-Nine- Year Average	2000- 2001 Season	Seven- Year Average
September	0.80	3.62	0.69	3.45
October	10.70	3.69	6.51	3.70
November	6.52	2.50	5.38	2.97
December	3.51	2.22	3.20	2.54
January	3.40	1.81	2.44	2.10
February	5.93	2.07	6.77	2.33
March	0.88	2.90	0.97	2.93
April	3.62	4.04	1.85	3.14
May	6.96	5.26	6.36	3.71
Total	42.32	28.11	34.17	26.87

Minimum temperatures (20°F or lower)

Ardmore		Burneyville	
Date	Temperature (°F)	Date	Temperature(°F)
December 11	17	December 11	18
December 12	15	December 12	17
December 14	19	December 14	18
December 17	18	December 17	17
December 22	17	December 22	20
December 30	20	January 2	17
January 1	20	January 3	13
January 2	16	January 20	16
January 3	15		
January 20	16		

Information in this report is inconclusive but can be of great value when compared with similar information from other sources. Weather data was taken from Oklahoma Mesonet weather stations located on the Headquarters Farm at Ardmore and the Red River Demonstration and Research Farm at Burneyville.

All available information pertaining to forage production should be used in making conclusions and decisions. This publication is intended to furnish supplemental information to aid in decision-making and idea formulation. I would like to acknowledge the following research assistants for their valuable help in collecting and analyzing data and preparing this report: Julie Barrick, Bret Flatt, Roger Hartwell, Steve Howe, Shawn Norton, and Frank Motal.