

Three-Year Small Grain Forage Yields at Overton

L. R. NELSON, S. WARD, AND J. CROWDER

Summary

Small grains and wheat in particular are often grazed for part or all of the cool season in Texas. Forage yields vary greatly between varieties and are often not closely related to grain yield potential. This report presents forage yield data for oats, wheat, and rye clipping tests at Overton. Data are presented for a 3-year period, and for the 1984-85 growing season. Data on winterkilling of oats and wheat is presented for the 1984-85 season. Oats had 100 percent winterkill on all varieties in 1983-84 and differential kill on varieties in 1984-85. The major portion of oat forage was produced in the fall and spring during warmer periods. Forage production for rye was quite uniform even during the January to February growing period, and no winterkill was noted. Wheat was intermediate between oats and rye for seasonal forage production, but produced less total forage than did oats or rye.

KEYWORDS: Small grains/forage yields/Overton/seasonal distribution/winterhardness/disease resistance.

Introduction

These studies were conducted to determine the forage yielding potential of numerous experimental and newly released varieties of wheat, oats, and rye in East Texas; to determine the seasonal distribution of the winter small grains; and to test the varieties for winterhardness and disease resistance or susceptibility.

Procedure

Available commercial and experimental wheat, oat and rye cultivars were evaluated for adaptation, forage production, and rust resistance in 1982-83, 1983-84, and 1984-85 at Overton.

All tests were planted in a prepared seedbed. Planting dates at Overton were early September in all 3 years. Seeding rates were 120 lb/A for all three small grains. Seed was planted with a drill into six row plots 12 feet in length and with 8-inch row spacing. Each forage specie was planted into a separate experiment. Each experiment was replicated four times.

Fertilizer application rates varied each year. Preplant application at Overton was 60-60-60 lb/A (N-P₂O₅—K₂O) in 1982 and 24-96-96 lb/A in 1983 and 1984. Plots were topdressed with ammonium nitrate nitrogen at the rate of 80 lb on October 25 and February 18, 1982-83. In 1983-

was produced by the Florida experimental FLX 1984LR, closely followed by Marshall and Tx-R-84-1, an experimental TAES line from Overton. Bellegarde (*Bromus catharticus*) bromegrass is an experimental from France. The seasonal yield of Gulf was lower than the above varieties, and this was thought to have been caused by winter freeze damage. The seasonal yield of the last six varieties were significantly reduced. These varieties were experimental ryegrass lines which were developed in Northern Europe.

When comparing varieties for yield, several years' data should be used if available. Table 2 presents forage yields of six ryegrass varieties over three growing seasons. Marshall produced the highest seasonal yield of 5,577

lb/A; however Gulf produced only about 110 lb/A less. Marshall, a more winterhardy variety, produced slightly higher yields during November—December and May—June, than did Gulf. Gulf yields during January—February and March—April were higher than Marshall for these periods. Marshall will normally produce higher yields in years when winterkilling occurs and Gulf will produce higher yields in warm years when winterkilling does not occur. Common ryegrass produced over 1,100 lb/A less than did Marshall.

Ryegrass varieties were tested for forage yield potential at Angleton in only one year, 1982-83 (Table 3). The four TAES experimentals produced the higher yields and were closely followed by Florida 80, Gulf, and Marshall.

TABLE 1. RYEGRASS, RESCUEGRASS, AND BROMEGRASS FORAGE CLIPPING TEST AT OVERTON, TEXAS, 1984-85

Variety	Harvest Date						Total Yield	% winter freeze damage	
	Nov. 15	Jan. 8	Mar. 14	Apr. 24	May 22	June 14			
	Pounds oven dried forage per acre								
ISI-79-1 ¹	779	984	1,017	4,659	1,244	669	9,353	20	
FLX 1984LR	1,044	693	1,255	4,652	1,447	0	9,092	5	
Marshall	1,022	673	960	4,348	1,530	0	8,533	3	
Tx-R-84-1	455	696	1,367	4,555	1,050	0	8,124	15	
Bellegarde (Bromegrass)	0	723	673	2,356	3,445	810	8,007	5	
Gulf	863	843	1,234	4,142	864	0	7,947	50	
ISI-78-1 ¹	569	810	739	2,885	2,218	725	7,946	80	
Fla 80	1,986	1,134	1,613	3,020	720	0	7,572	40	
Common	909	924	852	2,549	1,665	0	6,898	25	
BCSV 02060	555	501	836	2,121	1,426	0	5,439	10	
Cebeco LMW 2	564	529	989	2,245	749	0	5,075	30	
EIR 4	992	616	741	1,479	1,188	0	5,015	10	
BCSV 02065	760	732	650	1,322	1,188	0	4,651	5	
BCSV 02062	551	432	463	1,170	1,199	0	3,815	5	
Cebeco LM 12	410	331	650	1,132	799	0	3,321	10	
Mean	704	708	936	2,842	1,382	147	6,719		
LSD (10%) level	246	290	187	453	471	132	1,295		
CV	29.5	34.5	23.7	18.9	28.7	76	16.2		

Planted on September 17, 1984.

Fertilizer application: Preplant 400 lbs/acre of 6-24-24 (N, P₂O₅ and K₂O)

Topdressed 96 lbs N/acre (urea) on Oct. 11, 1984

50 lbs N/acre (urea) on Dec. 14, 1984

65 lbs N/acre (urea) on Feb. 20, 1985.

¹Rescuegrass.

TABLE 2. FORAGE YIELD OF RYEGRASS VARIETIES AVERAGED OVER 3 YEARS AT OVERTON, TEXAS

Variety	Harvest period				Total Yield
	Nov. & Dec.	Jan. & Feb.	Mar. & Apr.	May & June	
	Pounds oven dried forage per acre				
Marshall	1,575	807	2,172	1,199	5,577
Gulf	1,345	945	2,720	726	5,467
Florida 80	1,511	1,001	2,634	654	5,248
Common	950	807	2,172	1,190	4,453
TX-R-80-4 Exp.*	1,469	894	1,686	588	3,895
Shannon*	1,685	613	1,379	460	3,601

*Tested for first 2 years only.

84, 100 lb and 60 lb N/A (as urea) were applied on September 26 and February 26, respectively. In 1984-85, 96, 50, and 65 lb N/A (as urea) were applied on October 11, December 14, and February 20, respectively.

Forage plots were harvested with a flail type harvester the first 2 years. The third year, plots were harvested with a Hege 211 B forage harvester which has a sickle bar. All tests were cut at a 2-inch height. Percent dry matter (oven dried forage) was determined in order to obtain total dry matter.

Results and Discussion

Dry conditions during emergence and early fall 1982 limited yields of all forages. Freeze injury was not a problem. In 1983-84, dry fall conditions again limited yields. In addition, severe freeze damage occurred in December and also reduced yields. During the 1984-85 growing season, good stands were obtained. Freeze

damage did occur, which resulted in reduced forage yields on some varieties.

Forage yields are presented for three growing periods, November to December, January to February, and March to April (Table 1). Variety means are an average for 3 years with the exception of those noted in the tables, where only 2 years data were available. When winterkilling occurred, particularly with oats, a zero was averaged in for the late harvests and reduced 3-year mean yields for those periods as well as the total mean yield. Therefore, varieties with best winterhardiness are shown producing higher yields over a 3-year average. On a yearly basis this is also true; however, yield data were more erratic. The November to December forage yields for oats were high and freeze damage did not occur on any variety. The January to February harvest yield data were very low, while the March to April yields were much improved. They remained low compared to normal yields (when

TABLE 1. FORAGE YIELDS OF OATS, RYE, AND WHEAT AVERAGED OVER 3 YEARS (1982-83, 1983-84, 1984-85) AT OVERTON, TEXAS

Variety	Harvest Period			Av. Total Yields
	Nov.-Dec.	Jan.-Feb.	Mar.-April-May	
	3-Yr. Mean	3-Yr. Mean	3-Yr. Mean	
Pounds of oven dried forage per acre				
Oats				
Big Mac	1921	329	2841	5091
Mesquite	1885	295	3457	5637
Walken	1647	268	3623	5338
Coker 227	1711*	—†	1826*	3536*
Coker 234	1899	316	2401	4616
Bob	1647	221	2473	4341
Rye				
Vitagrazer	1481*	907*	1711*	4099*
Maton	1345	1093	2495	4933
Bonel	1439	1085	2777	5301
Elbon	950	901	1846	3697
Noble Found.—91	1379*	996*	2300*	4675*
Noble Found.—214	1941*	1022*	2264*	5227*
Noble Found.—142	1583	1138	2508	5229
Curley Grazer 2000	1557	1027	2107	4691
Wintergrazer 70	1194	908	2550	4654
Grazerblend II	1709*	478	2776*	4964*
Wheat				
Grazer II (Triticale)	1392*	294*	2771*	4457*
Coker 762	1060*	447*	2107*	3614*
Tx-75-213	1301	500	1494	3295
Southern Belle	1162*	422*	1915*	3499*
Delta Queen	1073*	434*	1762*	3269*
Mit	1237	541	1450	3228
Coker 68-15	1338	463	1697	3498
Northrup King pro 812	1257	544	1592	3393
TAM-106	1237	465	2050	3752
Coker-916	1109	942	1790	3841
McNair-1003	1227	533	1730	3490
Tx-73-009	1111*	383*	1444*	2938*
Florida 302	1770*	809*	1346*	3925*
Bradford	1201	445	1773	3419

*This variety was tested in only 2 years rather than 3.

†Due to freeze damage, no yields were recorded for Coker 227 during January to February.

TABLE 2. OAT VARIETY FORAGE TEST AT OVERTON, 1984-85

Variety	Harvest Dates					Total Yield	Winter injury %
	Nov. 15	Jan. 8	Mar. 11	Apr. 24	May 22		
	Pounds oven dried forage per acre						
Mesquite	2,081	886	507	5,659	374	9,506	10
Walken	1,572	804	659	4,890	1,413	9,339	0
Four-twenty-two	1,706	835	394	4,734	795	8,462	0
Harpool 833	2,191	764	400	4,124	511	7,989	10
Big Mac	2,238	988	316	3,838	436	7,815	5
Citation	2,113	886	127	3,704	934	7,765	40
Tx-82C-6023	1,730	896	77	2,720	1,402	6,825	60
Coker 234	2,045	947	42	2,545	990	6,569	70
Bob	1,954	662	235	3,115	570	6,535	20
Tx-81C-707	1,775	825	70	2,185	951	5,805	
Tx-82C-6035	1,650	743	125	1,867	923	5,309	80
Tx-82M-5018	2,358	499	0	622	920	4,398	80
Tx-81C-3102	1,944	896	32	1,016	495	4,384	80
Tx-81C-705	1,672	896	10	713	981	4,272	85
Tx-82M-4744	1,928	743	74	849	655	4,248	
Tx-82C-6317	1,696	916	29	1,037	294	3,972	95
Tx-82C-6217	2,551	540	32	313	384	3,820	99
Tx-82C-6014	2,400	305	0	307	282	3,294	—
Mean	1,978	779	174	2,458	739	6,128	—
LSD (10% level)	288	159	146	264	568	1,181	—
CV	12.3	17.3	70.8	9.1	65.1	16.3	—

Planted on September 17, 1985. Seeding rate = 120 lb/A.

Fertilizer application: Preplant 400 lb of 6-24-24/A (N, P₂O₅ and K₂O)
 Topdressed 96 lb N/A (urea) on October 11, 1984
 50 lb N/A (urea) on December 14, 1984
 65 lb N/A (urea) on February 20, 1985.

TABLE 3. RYE FORAGE VARIETY TEST AT OVERTON, 1984-85

Variety	Harvest Dates					Total Yield
	Nov. 14	Jan. 8	Mar. 11	Mar. 29	Apr. 24	
	Pounds oven dried forage per acre					
Bonel	1,484	1,211	1,512	1,148	897	6,251
Noble Foundation 142	1,711	1,423	1,148	978	854	6,114
Gurley GI 85	1,547	1,494	1,267	791	803	5,902
Maton	1,430	1,211	1,425	1,058	587	5,712
Gurley AFC 20-2	1,440	1,505	1,034	898	734	5,610
Gurl Graze 2000	1,632	1,294	1,236	786	621	5,569
Grazerblend 2	1,323	470	560	1,531	1,625	5,510
Wintergrazer 70	1,357	1,140	1,433	950	568	5,447
Elbon	1,652	1,376	1,230	644	497	5,399
Fredrick	1,287	870	1,032	894	1,115	5,199
Mean	1,487	1,200	1,188	968	830	5,672
LSD (10% level)	203	345	240	341	310	645
CR	11.3	23.9	16.8	29.3	31.1	9.5

Planted on September 17, 1984.

Fertilizer application: Preplant 400 lb of 6-24-24/A (N, P₂O₅ and K₂O)
 Topdressed: 96 lb N/A (urea) on October 11, 1984
 Topdressed: 50 lb N/A (urea) on December 14, 1984
 Topdressed: 65 lb N/A (urea) on February 20, 1985.

there is no winterkill). Oat forage yields for 1984-85 (Table 2) indicated true potential yields for a single growing season. The highest yielding variety was Mesquite which produced a total seasonal yield of 9,506 lb/A. The percent winterkilling was noted (Table 2) and variation ranged from 0 to 99 percent. Those varieties with less winterkilling continued to produce forage in the spring and had higher total yields.

The 3-year mean rye yields (Table 1) indicated good fall and winter forage production. There was no significant winterkill with rye, and forage was produced by all varieties throughout the growing season. Total season yields were similar to oat yields. The 1984-85 rye variety test (Table 3) indicated most of the forage had been produced by the end of March. The highest yielding variety was Bonel in 1984-85.

Wheat forage yields averaged over 3 years (Table 1) indicated a slightly lower yield than oats in the fall, and

had higher mean yields in January to February. Yields in the spring were very similar to oats. Grazer II triticale which was the only triticale line tested (tested in 1982-83 and 1983-84 only), produced higher yields than any of the wheat varieties. On the average for total seasonal yield, wheat produced less forage than did oats or rye. Yields for 1984-85 (Table 4) indicated that severe winterkill occurred on many lines during that season. Those lines with best winterhardiness produced higher yields. The Bounty wheats are hybrid wheats and have good winterhardiness for East Texas growing conditions. In this particular year (1984-85), winterhardiness was an advantage and resulted in superior yields. During years when winterkilling is not a problem, other varieties would probably surpass the more winterhardy lines. For this reason, the 3-year averages have importance in selecting a variety best suited to East Texas.

TABLE 4. WHEAT FORAGE VARIETY TEST AT OVERTON, 1984-85

Variety or Hybrid	Harvest Dates					Total	Winterkill %
	Nov. 14	Jan. 4	Mar. 11	Mar. 29	Apr. 25		
	Pounds of oven dried forage per acre						
Bounty 100	1,205	898	1,095	975	556	4,729	10
Ark. 48-7-4	1,399	784	755	893	821	4,652	10
TAM-106	1,309	578	554	1,323	775	4,539	0
Bounty 205	1,211	702	856	824	545	4,462	5
Bounty 301	1,246	629	794	940	568	4,176	10
Bounty 201	1,179	815	734	1,030	350	4,108	5
Bounty 310	1,283	691	742	824	551	4,092	5
HW-3015	1,342	815	824	753	179	3,913	20
Fla. 302	1,215	1,083	277	360	924	3,859	70
Tx-0-76-40-2	1,284	764	358	792	657	3,854	60
Rosen	1,256	578	951	710	343	3,837	5
Tx-0-82-185	1,345	588	446	792	632	3,803	25
Harpool 78 DW 14	1362	826	340	660	576	3,763	30
Bradford	1,175	722	486	956	352	3,720	40
Tx-0-73025	1,337	712	578	630	458	3,715	30
Coker 68-15	1,152	826	319	846	503	3,646	10
Bounty 202	1,118	661	680	988	199	3,645	10
McNair 1003	1,127	681	847	690	284	3,628	50
Hunter	1,289	1,001	452	418	431	3,590	90
HW-3021	1,290	877	477	653	291	3,588	80
Coker 916	1,135	578	592	930	323	3,577	5
NK Probrand 812	1,058	815	447	713	398	3,430	30
Mit	1,336	960	213	470	371	3,349	40
Tx-0-75-213	1,323	836	104	297	634	3,193	90
Mean	1,249	767	580	784	488	3,869	
LSD 10%	299	187	200	279	280	718	
CV	10.4	20.6	29.2	30.2	48.5	15.7	

Planted on September 17, 1984. Seeding rate = 120 lb/A.

Fertilizer application: Preplant 400 lb of 6-24-24/A (N, P₂O₅ and K₂O)

Topdressed: 96 lb N/A (urea) on October 11, 1984

Topdressed: 50 lb N/A (urea) on December 14, 1984

Topdressed: 65 lb N/A (urea) on February 20, 1985.