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# RYEGRASS FORAGE VARIETY TESTS AT OVERTON AND BEAUMONT IN 1993-94

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## Summary

Forage data are presented for the 1993-94 growing season for annual ryegrass (*Lolium multiflorum* Lam.) variety trials at the Texas A&M University Agricultural Research and Extension Centers at Overton and Beaumont. Growing conditions were generally good with no cold damage. Forage yields were above normal at Beaumont (9,750 lb/acre mean) and about normal at Overton (4,598 lb/acre mean). 'TAM 90' and 'Gulf' were top varieties at Overton and 'Jackson', Gulf, and TAM 90 at Beaumont. 'Marshall' ryegrass at Overton was the only entry with rust.

## Introduction

These experiments were conducted to determine adaptability and forage yield potential of annual ryegrass varieties as well as several experimental lines for northeast and southeast Texas growing conditions. We also wanted to determine the seasonal distribution of forage, crown rust resistance, and winter hardiness.

## Procedure

Available commercial varieties and experimental lines of annual ryegrass were planted at Overton and Beaumont on 28 and 24 September 1993, respectively. Each test was planted into a prepared seedbed. The test site at Overton was a Darco fine loamy sand and was fertilized with 50 lb of N and 100 lb P<sub>2</sub>O<sub>5</sub>/acre and K<sub>2</sub>O/acre at planting. In addition, the Overton site was top-dressed with 50 lb of N on 15 November, 52 lb N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O, and 48 lb sulfur/acre on 6 December, and 50 lb N on 11 March. The total N applied at Overton was 202 lb/acre. The test site at Beaumont was on a Bernard-Morey silt loam and was fertilized with 50 lb N and P<sub>2</sub>O<sub>5</sub>, and 100 lb of K<sub>2</sub>O lb/acre at planting. The experiment was top-dressed with 25 lb N/acre after each harvest on 29 November, 16 December, 26 January, 17 February, 4 March, 21 March, and 31 April for a total N application of 225 lb/acre. Seeding rates were 30 lb/acre for both locations. Seed were drilled into seven row plots at Overton

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and six row plots at Beaumont, 12 feet in length with 7-inch row spacing. Experimental design was a randomized complete block with four replications. Forage was harvested at Overton with a Hege sickle bar forage harvester to 2-in. stubble height. Forage at Beaumont was harvested with a rotary mower which deposited the forage into a basket. A subsample of the harvested forage was dried at 150°F for 48 hr to determine percent dry matter. A 10% least significant difference was computed for each harvest on each experiment. This value can be used to make comparisons between varieties. Differences greater than this value are real 9 out of 10 times and may be considered significant.

### **Results and Discussion**

Adequate soil moisture was available to obtain good stands in each experiment. Soil moisture became limiting in autumn at Overton which reduced fall forage production. A dry April at Overton resulted in early production of seed heads and in below average late spring forage production. The lowest temperature recorded during the growing season at Overton was 16°F on 8 January and 24°F at Beaumont on 19 January. No significant freeze damage was detected and no winterkill occurred at either location.

The first ryegrass clipping at Overton was taken on 2 December (Table 1) when the taller entries were about 10 inches in height. 'Gulf' produced the top yield of 883 lb/acre closely followed by 'TAM 90', 'Jackson', 'Dargle', and several experimental lines. TAM 90 produced the highest yield at the 25 January harvest. At the 10 March harvest, highest forage yields were produced by entries experimentals TXR91-TA5EF, NCSU 91, TXR86-2L91-11EF, and TXR92-5, closely followed by several varieties. Forage yields at the 29 March harvest were closely grouped. The 22 April harvest was somewhat below normal due to dry moisture conditions and was composed of mostly seed heads. Yields at the last harvest on 22 May were good due to rainfall. The May harvest was also mostly stems and seed heads. The total season forage yields for ryegrass varieties at Overton in 1993-94 were slightly below normal compared to previous years. TAM 90 was the highest yielding variety with a yield of 6,483 lb/acre and was followed by Dargle and Gulf which produced yields of 5,595 and 5,377 lb/acre, respectively.

The forage data from Beaumont (Table 2) illustrate somewhat different results with above normal forage yields. Production at the first harvest on 22 November was low, when 'Jackson' produced the highest yield. There were little differences between entries at the second and third harvest. Very good forage yields were produced in each of the next five harvests reflecting ideal moisture and temperature conditions. In total season yield, highest yielding varieties were



Jackson, Gulf, TAM 90, 'Rio', and 'Marshall'. Several experimental lines also produced excellent yields. No winterkill occurred at Beaumont. We speculate that the warm winter favored varieties such as Gulf which was selected at the Beaumont location nearly 30 years ago.

In comparing forage yield for locations, yields were higher at Beaumont compared to Overton. This was caused by drought stress at Overton which reduced yields on all entries in April and May. Forage yields at Beaumont during the late spring were very high. These environmental conditions resulted in the seasonal forage distribution at Overton to be higher in the early spring and lower in the late spring. At Beaumont, the distribution was a high yield in the early spring and an even higher yield in the late spring. These environmental conditions probably affected some varieties differently than other varieties. Earlier maturing varieties may have tended to produce seed heads as soon as moisture stress occurred at Overton. At Beaumont, later maturing varieties had moisture and time to continue to produce forage during the late spring.

Crown rust was present at Overton, however, disease severity levels were very low. Data in Table 1 indicate that Marshall remains a susceptible variety to crown rust, however, all other entries appear to be moderately resistant or resistant. This was the second year in a row that crown rust was not severe at the Beaumont location. Results of these studies should be used with caution. More than one year's data is desirable when variety recommendations are made because of interaction with weather conditions. This is especially true since the growing season of 1993-94 was unusually warm with no below normal temperatures.

Table 1. Ryegrass forage variety test at Overton, Texas for 1993-94.

Variety	Harvest Dates						Total Yield	Crown Rust <sup>1</sup>
	2 Dec	25 Jan	10 Mar	29 Mar	22 Apr	22 May		
-----pounds of dry matter per acre-----								0-9
TAM 90	649	1414	1197	1170	1155	898	6483	.1
Dargle	607	1114	1096	822	914	1042	5595	0
Gulf	883	915	1019	860	1115	586	5377	0
TXR92-3*	313	934	1056	1052	1161	710	5226	0
NCSU 91*	436	779	1585	889	914	514	5117	1
Southern Star	446	861	1085	1047	1078	466	4983	.1
Jackson	610	1028	879	1100	654	710	4981	1
TXR91-TA5EF*	276	512	1722	862	997	597	4966	0
Passeral	524	634	1027	1068	1136	552	4941	1
TXR92-5*	453	1008	1323	845	841	387	4857	0
FLX 1993 LR*	487	570	1126	958	903	782	4827	0
FL-80	514	848	1223	844	786	588	4803	0
SS 33 DK*	286	1125	777	1124	903	534	4749	0
TXR92-4*	265	968	1226	1018	965	292	4734	0
SCF-1*	437	914	1133	1150	812	279	4724	.1
TXR86-2L91-11EF*	315	767	1326	1112	817	384	4721	0
Marshall	346	540	846	1115	1113	665	4625	5
DSV 2X-100*	539	771	996	776	592	888	4567	.1
TXR91-10EI*	468	665	978	1040	1019	377	4547	0
TXR91-SR5EF*	613	782	1187	793	817	353	4546	0
WVPB-AR-90-300*	446	721	1136	1035	814	359	4511	.1
Miyukiaoba*	535	1066	654	1033	746	465	4498	1
Rio	244	648	861	1194	902	635	4484	0
TXR86-2L91-12EI*	223	729	1050	1174	780	471	4427	0
WVPB-AR-90-1*	65	298	1137	1020	1258	527	4304	0
TXR92-1*	319	730	941	914	1013	355	4272	0
TXR91-9EF*	425	756	776	1025	828	458	4269	0
TXR91-A8EI*	302	746	930	887	928	465	4258	0
Waseaoba*	403	986	960	829	511	542	4231	1
TXR92-6*	319	598	861	1009	946	456	4190	0
WVPB-AR-93-101*	320	633	999	1165	587	462	4166	0
TXR92-2*	223	681	863	926	979	492	4164	0
Surrey	226	573	1093	930	750	375	3947	0
TXR91-SR6EI*	454	698	650	858	783	472	3915	0
DSV 4X-200*	218	424	836	887	625	606	3595	0

Table 1. Ryegrass forage variety test at Overton, Texas for 1993-94 (Continued).

Variety	Harvest Dates						Total Yield	Crown Rust <sup>1</sup>
	2 Dec	25 Jan	10 Mar	29 Mar	22 Apr	22 May		
-----pounds of dry matter per acre-----								0-9
Greenstone NT 504*	91	382	563	601	694	766	2927	0
Mean	397	773	1031	976	884	542	4598	-
LSD (0.10)	253	268	429	251	323	320	1011	-

<sup>1</sup>0 = no rust, .1 = a trace of rust, 9 = severely rusted.

Planted September 28, 1993. Fertilization: Preplant 50 lbs N, 100 lbs P<sub>2</sub>O<sub>5</sub> and 100 lbs of K<sub>2</sub>O/ac.

Topdressed with 50 lbs/ac N on November 15 and March 11 applied as ammonium nitrate.

This test was topdressed again on December 6, 1993 with 52 lbs of N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O/ac and 48 lbs of sulfur/ac.

\*Experimental line, seed is not presently available.



Table 2. Annual ryegrass forage variety test at Beaumont, Texas 1993-94

Variety	Harvest Dates									Total Yield
	22 Nov	15 Dec	25 Jan	16 Feb	4 Mar	18 Mar	30 Mar	14 Apr	28 Apr	
Jackson	636	657	523	1327	1686	1612	1629	1241	1731	11042
FLX 1993 LR	455	610	678	1651	1881	1456	1257	1271	1713	10973
NCSU 91	390	493	541	1417	1805	1374	1448	1312	2139	10920
TXR91-TA5EF	130	502	636	1537	1806	1537	1339	1300	1872	10659
TXR91-A8EI	409	674	686	1621	1866	1343	1285	1113	1602	10598
TXR91-SR6EI	285	607	639	1389	1940	1298	1300	1155	1806	10417
TXR91-9EF	395	691	613	1456	1850	1403	1282	1027	1690	10407
Gulf	543	751	598	1220	1485	1418	1415	1267	1703	10399
SS 33DK	420	664	827	1259	1498	1850	1390	1036	1350	10293
TXR91-10EI	359	665	580	1321	1789	1321	1356	1077	1667	10135
TAM 90	386	748	805	1471	1649	1388	1213	949	1402	10011
Rio (OFI-AR42)	457	838	508	1167	1555	1219	1168	1195	1873	9981
TXR92-5	331	727	791	1495	1530	1281	1194	1036	1518	9903
TXR91-SR5EF	184	617	573	1430	1907	1498	1129	1090	1397	9825
Marshall	429	540	424	1183	1638	1395	1254	1224	1709	9796
TXR92-6	285	518	608	1270	1931	1308	1284	973	1569	9746
WVPB-AR-93-101	316	622	600	1216	1608	1196	1180	1312	1670	9721
TXR92-4	223	675	836	1287	1726	1331	1182	1023	1378	9661
TXR92-1	210	494	545	1471	1790	1514	1238	947	1363	9572
FL-80	481	567	504	1350	1789	1612	999	927	1316	9545
TXR-92-3	247	653	593	1220	1599	1130	1182	1122	1728	9473
TXR92-2	138	494	537	1214	1603	1294	1216	1172	1620	9287
WVPB-AR-90-300	329	595	642	1259	1551	1413	1051	981	1438	9259
Southern Star	456	573	499	1281	1458	1327	1060	1117	1395	9168
TXR86-2L91-12EI	183	607	617	1331	1579	1147	1156	1085	1449	9154
TXR86-2L91-11EF	166	530	488	1311	1698	1285	1142	1129	1314	9062
Passeral	494	520	346	1057	1208	1070	1255	1388	1671	9009
Surrey	210	507	492	1294	1697	1312	1200	843	1318	8873
WVPB-AR-90-1	145	409	473	1011	1399	1214	1103	1246	1577	8577
SCF-1	397	586	613	1151	1440	1267	999	899	1080	8432
Greenstone NT504	200	549	491	967	1418	872	985	1241	1509	8232
Test Mean	330	600	590	1310	1660	1340	1220	1120	1570	9750
LSD	119	210	236	277	304	332	226	241	247	1266

Planted September 24, 1993. Fertilization: Preplant 50 lb N and P<sub>2</sub>O<sub>5</sub> and 100 lb K<sub>2</sub>O/acre. Topdressed (urea) with 25 lb N/acre after each harvest on 11-29-93, 12-16-93, 1-26-94, 2-17-94, 3-4-94, 3-21-94, and 3-31-94.