Forage Research in Texas

Departmental Technical Report No. 81-12

Department of Soil and Crop Sciences

SG - 0051

Project: H-6046

Workers: L.R. Nelson

Location: Overton

FORAGE VARIETY TESTS FOR OATS, TRITICALE, WHEAT, RYE AND RYEGRASS

OBJECTIVES:

These trials were conducted to determine which varieties produce highest forage yields in East Texas. A second objective was to test newly released or experimental lines to determine their adaptation and cold tolerance under East Texas environmental conditions.

PROCEDURE:

A separate experiment was conducted for each winter annual species. For each forage test, varieties were planted in 4 x 12' plots and replicated four times. Forage yields were determined by clipping a 20 square foot section of each plot at a uniform height. The samples were then dried in an oven, weighed, and pounds of dry forage per acre calculated. A test was clipped from three to as many as six times throughout the growing season, depending on the amount of forage growth made by the plants.

Forages were planted into conventionally tilled seedbeds usually during the first 2-weeks in September. A broadcast application of fertilizer at a rate of 60-60-60 (N-P_2O_5-K_2O) lbs/ac was applied in late August. Additional nitrogen was applied in split application in November and February for a total N rate of about 210 lbs/acre.

RESULTS AND DISCUSSION:

Moisture was limited for the first 2-weeks after planting before a tropical storm resulted in several inches of rain in late September. Wet conditions caused some buildup of seedling diseases, particularly in ryegrass, but yield losses appeared to be minimal. Rainfall amounts by months were: September-6.64; October-2.47; November-4.31; December-5.12; January -3.62; February-2.69; March-2.67; April-4.35; and May-6.15. We observed no severe winterkill with the coldest temperatures occurring on December 18 (16° F) and March 1 (17° F). Due to the warmer than average temperatures, an extra forage clipping was obtained on all of the small grain crops.

In the ryegrass experiment (Table 1), the test was harvested six times. In the Dec 4th harvest, forage yields were below normal and no significant differences were observed between varieties. Seedling

diseases appeared to have reduced fall yields of most if not all of the varieties. In the second harvest on Feb 6, the highest yield was produced by Gulf followed by Shannon and several other varieties. In the March 10 harvest, Ga Reseeding produced the highest yield followed by Tx-O-R-78-3 and several other lines. In the Apr 2 harvest, Marshall produced the highest yield while Baritra produced the highest yield on April 23rd. The largest yield for the season was produced on May 28 and the leading variety was NAPB-157. The total forage yield provides an indication of the consistency of the varieties throughout the ryegrass growing season. Some varieties produce a major portion of the forage before May while others produce a major amount of forage after May 1st.

The wheat forage experiment (Table 2) was harvested five times. No significant differences were determined for the Nov 26th harvest. In the second harvest (Jan 24) the top yield was produced by Delta Queen followed by a number of closely grouped varieties. In the March 5th harvest, TAM-W-101 produced the highest yield. This is somewhat surprising since TAM-W-101 (a hard winter wheat) had a fairly low yield on Jan 24th, but produced the best yield on March 5th. The 16° F temperature recorded on March 1st may have retarded the growth on a number of the soft wheats. The experimental line Ga H -69-56-A-1 lead the study in the April 4th harvest. In the final harvest on May 2nd, the top yield was produced by T-O-76-13, a Texas experimental, followed by several closely grouped varieties. Little real differences exist for the top several selections for total yield.

In the rye forage experiment (Table 3), the forage was clipped five times with the first harvest on Nov 19th. In this test, significant differences are noted between varieties at each harvest date. It should also be noted that a large portion of the total forage yield was produced during January and February which is the period of shortest forage supply for most cattlemen.

In the oat forage study (Table 4), five harvests were taken. Most of the forage was produced after March 1st. The highest yields on the March 13th clipping were produced by NF-95, Walken and several other closely grouped varieties. On the Apr 3th harvest NF-188, Walken and Nora produced the higher yields. On the last harvest (May 5), TAM-O-312 produced the highest yield followed by Ora and Four twenty-two. The range of the total yield between varieties was very close together. Therefore, varietal differences in forage distribution over the growing season are of more importance than differences in total yield.

Triticale forage yields (Table 5) were well below yields of the other small grain and ryegrass annuals. Triticale apparently does not tiller out as well as other winter annuals. Most of the selections are also subject to winter injury and regrowth after clipping is rather slow. The varieties in this study do not appear to have much forage potential for East Texas.

Table 2. Wheat forage variety test at Overton, TX 1980.

Variety	Harvest Date					Total Yield
	Nov 26	Jan 24	Mar 5	Apr 4	May 2	
	Pounds of dry matter per acre					
T-O-7907-72[1]	1085[2]	1861a-b[3]	797e-g[3]	1390f-g[3]	1901b-d[3]	7034
TAM-W-101	380	786c-e	2171a	1571e-g	1842c-e	6750
T-O-73-61[1]	664	1447a-c	1593b-c	1203g-h	1701c-f	6608
Ga-H-69-56-A-1[1]	144	559d-e	1324b-e	2839a	1646d-f	6512
Sturdy	257	750c-e	1657b	2413b	1325g-i	6402
McNair 1003	735	1534a-c	781e-g	1350f-g	1832c-e	6232
T-O-73133[1]	424	1082a-e	1054c-f	1840c-e	1719c-e	6119
NF-21	143	1262a-d	1380b-d	1534e-g	1756c-e	6075
Maverick	720	1111a-e	1379b-d	1847c-e	985i	6042
T-O-73-93[1]	384	896c-e	1193b-f	2010c-d	1510e-g	5993
McNair 3003	450	1116a-e	804d-g	1555e-g	2034a-c	5959
Delta Queen	393	1890a	306f-g	1152g-h	2203a-b	5944
Coker 68-15	774	1037b-e	1141b-f	1698d-f	1280g-i	5930
T-O-72-9[1]	148	534e	1198b-f	2414b	1625d-f	5919
T-O-74-39[1]	309	1247a-d	917d-f	1497e-g	1857c-e	5827
McNair 3069	1289	1352a-d	267g	857h	2036a-c	5801
T-O-76-13[1]	217	1062b-e	872d-f	1211g-h	2290a	5652
Coker 75-6	368	716c-e	1306b-e	1580e-g	1638d-f	5608
Agent	310	1193a-e	1188b-f	1181g-h	1685d-f	5557
T-O-76-13[1]	450	1149c-e	905d-f	1172g-h	1625d-f	5301
Coker 76-22	291	1213a-e	645f-g	1443e-g	1618d-f	5210
Arthur 71	302	393	997d-f	2139b-c	1355f-h	5186
T-O-73-54[1]	183	874a-e	1013d-f	1439e-g	1560d-g	5069
Tex Red	252	705c-e	1301b-e	1363f-g	1109h-i	4730
% Distribution	7.5	18.2	18.5	27.4	27.6	
Mean	444	1074	1091	1612	1672	5893
CV	50	45	30	15	25	

[1] Varieties followed by 1 are experimental lines. [2] There were no significant differences in yield for the Nov. 26 harvest. [3] Variety yields within a column followed by the same letter are not significantly different at the 5% level by Duncan's test. Planting date: 9/11/79.

Table 1. Ryegrass variety forage clipping study at Overton, TX 1979-80.

Variety	Harvest date: Dec. 4	Feb. 6	Mar. 10	Apr. 2	Apr. 23	May 28	Total Yield
	Pounds of dry matter per acre						
NAPB-157	575[1/]	998b-d[2/]	1228a-d[2/]	1052a-c[2/]	1567a-e[2/]	2393a-e[2/]	7813
Gulf	742	1788a	1062a-f	680d-f	1483a-g	1679a-f	7434
Shannon[3/]	636	1355a-b	1180a-e	909a-f	1364b-g	1979a-d	7423
Ga Reseeding	211	1260a-c	1541a	837a-f	1466a-g	1527b-g	6842
Barspectra	614	959b-d	1132a-f	1059a-b	1188e-g	1866a-e	6818
Moritz[3/]	500	1077a-d	1272a-c	1050a-c	1238c-g	1653b-f	6790
Baritra	261	679b-d	850b-f	922a-d	1903a	2148a-b	6763
Marshall	391	1012b-d	1266a-c	1103a	1704a-c	1286d-g	6762
Mont. Sel	326	959b-d	1167a-f	815a-f	1519a-f	1751a-e	6537
Tx-0-R-78-3	435	1243a-c	1478a	608f	1152e-g	1522b-g	6438
NAPB-150	526	988b-d	1024a-f	940a-d	1282c-g	1652b-f	6412
Lyra	618	888b-d	1029a-f	1051a-c	1364b-g	1350d-g	6300
Trident	182	651b-d	1072a-f	1109a	1408b-g	1878a-e	6300
Maris	412	777b-d	914b-f	1040a-c	1750a-b	1379c-g	6272
Tx-0-R-78-2	326	1296a-c	1339a-b	624e-f	1215d-g	1463c-g	6263
Magnolia	287	947b-d	1248a-d	754c-f	1422b-g	1585b-g	6243
N-K-K-20	295	579b-d	1110a-f	860a-f	1780a-b	1562b-g	6186
N-K-78-120	162	502c-d	893b-f	905a-f	1523a-f	2091a-c	6076
Meritra	330	547b-d	823b-f	970a-d	1426b-g	1886a-e	5982
Multi-mo[3/]	255	551b-d	944b-f	1030a-c	1566a-e	1629b-f	5975
Asso	391	780b-d	1174a-e	843a-f	1027g	1539b-g	5754
Tetrablend 444	294	755b-d	1042a-f	760b-f	1345b-g	1510b-g	5706
Tx-0-R-78-1	249	917b-d	1194a-e	759b-f	1204d-g	1202e-g	5525
Common	123	539c-d	876b-f	703d-f	1268c-g	1606b-f	5115
SRGE	118	515c-d	940b-f	760b-f	1399b-g	1002g	4734
Fla. Reseeding	188	680b-d	745a-f	864a-f	1159e-g	1020f-g	4656
Mean	328	840	1051	872	1418	1583	6092
CV	60	56	29	20	19	27	

[1/] No difference between varieties. [2/] Varieties within a column followed by the same letter are not significantly different by Duncan's test. [3/] Tetraploid varieties.

Table 3. Rye forage variety test at Overton, TX 1979-80.

Variety	Harvest Date: Nov 19	Jan 23	Feb 29	Apr 1	May 5	Total Yield
	Pounds of dry matter per acre					
Gurley's Abbruzzi	757a-b[1/]	3301a[1/]	662h[1/]	1109g-j[1/]	2768a-b[1/]	8597
Wrens Abbruzzi	889a	2882a-b	439i	836j	3402a	8448
NF-72	629a-c	2083c-f	1159d-e	2082a-b	1915d-e	7868
Gurley's G-175	589b-d	2526b-c	758g-h	1049h-j	2902a-b	7824
Maton	503b-e	1609e-h	1537a-b	1916a-c	2025c-e	7592
Koolgrazer	261e	1351h	1652a	2247a	2065c-e	7576
NAPB-SR-80	477c-e	2189c-e	955e-g	986i-j	2744b	7351
Gurley's Grazer 2000	314d-e	1995c-g	915f-g	1285f-i	2647b-c	7156
Bonel	482c-e	1540f-h	1546a-b	1772b-d	1779e	7119
NF-74	438c-e	1732d-h	1306b-d	1661c-e	1965d-e	7102
ACCO-WR-811	876a	2281c-d	741g-h	1226f-i	1902d-e	7026
Pennington Wintergrazer	349c-e	1620e-h	1317b-d	1679c-e	1879e	6844
McNair Vita Graze	385c-e	2262c-d	726g-h	830j	2566b-d	6769
NF-214	319d-e	1662e-h	1535a-b	1355e-h	1889e	6760
Athens Abbruzzi	348c-e	1829d-h	1094d-f	1438d-g	2013c-e	6722
Elbon	391c-e	1410g-h	1416a-c	1476d-f	1937d-e	6630
NF-500	407c-e	1587e-h	1178c-e	1920a-c	1397e	6489
% Distribution	6.8	27.3	15.3	20	30.5	
Mean	495	1992	1114	1463	2223	7287
CV	34	18	14	16	19	

[1/] Variety yields within a column followed by the same letter are not significantly different at the 5% level by Duncan's test.

Table 4. Oat forage variety test at Overton, TX 1979-80

Variety	Harvest Date					Total Yield
	Nov 28	Feb 4	Mar 13	Apr 4	May 5	
	Pounds of dry matter per acre					
TAM-O-312	770[1]	1789[1]	2069ab[2]	866c[2]	3757a[2]	9251
NF-95	1275	1495	2405a	919c	2832bcd	8926
Coker 76-16	1222	1584	1815bc	971c	3253abc	8845
Coker 77-19	1352	1908	1724bc	853c	2994bcd	8831
NF-188	919	1394	2082ab	1268a	3152abc	8815
Walken	858	1689	2457a	1222ab	2576cd	8802
Coker 227	731	1658	2084ab	864c	3399ab	8736
Four-twenty-two	591	1310	2353a	935c	3384ab	8573
Ora	920	1117	2038ab	992bc	3478ab	8545
Coker 78-18	1022	1450	2054ab	834c	2938bcd	8298
Coker 79-22	1395	1468	1353c	790c	3109abc	8115
Fla 501	1017	1706	1476c	925c	2942bcd	8066
NF-17	613	1068	2435a	931c	2886bcd	7933
Mesquite	940	1318	2447a	887c	2233d	7825
Big Mac	708	1478	1792bc	941c	2901cbd	7820
Coker 324	752	1452	1979ab	849c	2785cbd	7817
Coker 76-20	1099	1361	1659bc	743c	2896bcd	7758
Nora	808	900	1996ab	1011bc	2776bcd	7491
% Distribution	11.3	17.4	24.1	11.2	36.1	
Mean	944	1452	2012	933	3016	8358
CV	56	41	17	17	15	

[1] In the Nov and Feb harvest there were no significant differences in yield at the 5% level between varieties.

[2] Variety yields within a column followed by the same letter are not significantly different at the 5% level as judged by Duncan's test.

Table 5. Triticale forage variety test at Overton, TX 1980.

Variety	Harvest Date				Total Yield
	Dec 4	Feb 1	Mar 12	Apr 3	
	Pounds of dry matter per acre				
Noble Foundation 55	640a[1/]	1971a[2/]	934a[1/]	891b[2/]	4436
South Texas Blend	296a	1191ab	1267a	1570a	4324
Noble Foundation 185	495a	2314a	181a	634b	4261
Noble Foundation 12	499a	1938a	767a	875b	4079
6 T-B227	820a	1802a	585a	816b	4023
6 T-A-876	72a	430b	1406a	1754a	3662
Harpool-T-71	517a	1697a	724a	719b	3657
Mean	477	1621	928	1307	4063
CV	73	45	46	30	

[1/] In the Dec 4 and March 12 harvest there were no significant differences.

[2/] Varieties within a column followed by the same letter are not significantly different at the 5% level by Duncan's test.