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Forage Yields from 2006-2007 Small Grains Variety Trial

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THE SAMUEL ROBERTS NOBLE FOUNDATION

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Introduction

In an effort to assist producers in Oklahoma and Texas judge variety performance, the Noble Foundation has held trials to determine forage and grain yields of commercially available varieties and advanced experimental lines of small grains. The objective of this report was to summarize forage yields of commercial varieties in the 2006-2007 trials.

Trial Procedures

The small grains test was conducted at the Noble Foundation Headquarters Farm (HQF) near Ardmore and the Red River Demonstration and Research Farm (RRF) near Burneyville, Okla. Soils were a Heiden clay at HQF and a Minco fine sandy loam at RRF. Twelve sources contributed entries to the trial (Table 1).

The entries were planted into a clean-tilled seedbed on Sept. 26, 2006, at HQF and Sept. 19, 2006, at RRF. Each entry was sown at 2,000,000 pure live seed (PLS) per acre, which approximated 90 to 120 lbs PLS/ac. The seeds were drilled in 7-inch rows at a 1-inch planting depth with a HEGE 500 drill into two adjacent 5- by 15-foot plots. The adjacent plots represented forage only use and dual purpose forage and grain use. Plots harvested for forage were harvested on Feb. 7, March 5 and April 5 at HQF and on Feb. 22, March 20 and April 10 at RRF. Plots harvested for dual purpose forage and grain were harvested for forage on Feb. 7 and for grain on June 6 at HQF, and for forage on Feb. 22 and for grain on June 12 at RRF.

At HQF, fertilization consisted of preplant incorporation of 100 lbs N/ac and 46 lbs P2O5/ac on Sept. 19, 2006, and a topdress application of 80 lbs N/ac on Feb. 16, 2007. Broadleaf weeds were controlled with an application of 2,4-D amine at one pt/ac on Jan. 2, 2007. At RRF, plots were topdressed with 80 lbs N/ac on Nov. 29, 2006, and 70 lbs N/ac on Feb. 23, 2007. Broadleaf weeds did not pose a problem at RRF.

The trials were randomized complete block designs with three replications. Variety/strain were blocked by crop and randomized within each replication. Data were analyzed by crop with the general linear models procedure in SAS (Statistical Analysis Software, Cary, N.C.), and means were separated by the least significant difference (LSD) method ($P \leq 0.05$).

Results and Discussion

Growing conditions were fair for the trial (Table 2). Although precipitation for Ardmore and Burneyville was near the long-term average from October 2006 through April 2007, forage production was limited by the lack of subsoil moisture following severe drought throughout the spring and summer of 2006. Rainfall increased substantially in May and June, but these increases occurred towards the end of the trial.

Fall forage production was best for Bates, Maton II, Wintergrazer 70 and TAMcale 5019 on the clay soils at HQF, as determined by forage yields on Feb. 5 (Table 3). The best fall forage producing wheat varieties on the clay soils included Coker 9553 (soft), Fannin, Kingrazer (soft), Doans and Overley. On sandy loam soils at RRF, the best fall forage producers included the ryes: Bates, Elbon, Maton, Oklon and Wintergrazer 70; the triticales: TAMcale 5019 and TAMcale 6331; and the oats: Dallas, Harrison and Plot Spike (Table 4).

Total forage production was similar among all rye and triticale varieties on the clay soils at HQF, ranging from 3188 to 4013 lbs/ac (Table 3). Total annual forage production among wheat varieties was best for Coker 9553 (soft), Doans, Duster, Fannin and Kingrazer (soft), with yields ranging from 3416 to 3968 lbs/ac. Dallas and Harrison had the highest total forage production of oat varieties, ranging from 2775 to 2918 lbs/ac.

On the sandy loam sites at RRF, total forage production was best for the ryes: Bates, Maton, Elbon and Oklon; and the triticales, TAMcale 5019 and TAMcale 6331 (Table 4). Total forage production among wheat varieties was best for Custer, Deliver, Doans, Duster, Endurance, Lockett, Overley and Ranger Brand (soft).

Overall, varieties that performed well across both locations, in terms of total forage production, included the ryes: Bates, Elbon, Maton and Oklon; the triticales: TAMcale 5019 and TAMcale 6331; and the wheats: Doans and Duster.

Appendices

Table 1. Contributors to the 2007 small grains variety test at the Noble Foundation Headquarters Farm, Ardmore, Okla., and Red River Demonstration and Research Farm, Burneyville, Okla.

Code	Contributor
Andrews	Andrews Farm and Seed, Inc., Carthage, Mo.
AgriPro	AgriPro, Vernon, Texas
Johnston	Johnston Seed Company, Enid, Okla.
LSU	Steve Harrison, LSU Ag Center, Baton Rouge, La.
NF	Malay Saha, Forage Improvement Division, Noble Foundation, Ardmore, Okla.
OKFS	Oklahoma Foundation Seed Stocks, Inc., Stillwater, Okla.
TFS	Texas Foundation Seed Service, Vernon, Texas
Pennington	Pennington Seed, Madison, Ga.
MBS	MBS Seed, Ltd. Co., Denton, Texas
RM	Ragan & Massey, Inc., Ponchatoula, La.
TAM	Russell Sutton, Texas A&M Res. & Ext. Service, Dallas, Texas
Topco	Curt Johnston, Topco Seed Company, Texas

Table 2. Average 2006-2007 monthly high and low temperatures and precipitation for the Noble Foundation Headquarters Farm, Ardmore, Okla., and Red River Demonstration and Research Farm, Burneyville, Okla.

			Temperature		Precipitation	
Location	Month	Year	Avg. High	Avg. Low	Total	106-yr Avg.
Ardmore	Sep	2006	85	60	1.69	3.60
	Oct	2006	76	52	3.92	3.70
	Nov	2006	65	42	3.17	2.48
	Dec	2006	55	35	3.28	2.24
	Jan	2007	47	31	2.50	1.82
	Feb	2007	55	34	0.50	2.07
	Mar	2007	71	49	3.88	2.85
	Apr	2007	68	49	3.08	3.98
	May	2007	79	62	7.93	5.23
	Jun	2007	85	68	8.31*	4.01
	Sep-Jun	2006-2007			38.26	31.98
						65-yr avg.
Burneyville	Sep	2006	85	58	1.92	3.78
	Oct	2006	77	50	2.40	3.73
	Nov	2006	67	40	2.88	2.41
	Dec	2006	57	34	2.31	2.16
	Jan	2007	48	29	1.67	1.60
	Feb	2007	57	32	0.46	2.19
	Mar	2007	71	51	1.76	2.92
	Apr	2007	69	47	1.40	3.58
	May	2007	81	62	9.13	5.09
	Jun	2007	90	66	7.91*	4.20
	Sep-Jun	2006-2007			31.84	31.66

*Rainfall may have exceeded these amounts due to malfunction of the instruments on June 14.

Table 3. Forage yield of commercial varieties of small grains at the Noble Foundation Headquarters Farm (HQ), Ardmore, Okla., harvested on Feb. 5, March 6 and April 5, 2007

		Harvest dates			
Crop	Variety [Source]	2/5	3/6	4/5	Sum
		lbs/ac			
Oats	Dallas [MBS]	552	1029	1194	2918
	Harrison [MBS]	999*	830	1089	2775
	Plot Spike [RM]	665	580	1071	2315
	LSD	369	282	300	587
Rye	Bates [OK FS]	1344	1354	1154	3854
	Elbon [OK FS]	638	1106	1445	3188
	Maton [OK FS]	681	1195	1575	3452
	Maton II [Topco]	1365	1232	971	3567
	Oklon [OK FS]	990	1274	1241	3506
	Wintergrazer 70 [Pennington]	1513	1103	925	3540
	LSD	923	241	206	1021
Triticale	TAMcale 5019 [AgriPro]	1461	1507	1045	4013
	TAMcale 6331 [AgriPro]	820	1372	1247	3438
	LSD	839	353	223	891
Wheat	2174 [OK FS]	638	940	1600	3179
	Coker 9553 (soft) [AgriPro]	1147	1459	1361	3968
	Coker 9663 (soft) [AgriPro]	757	1373	1163	3294
	Coronado [AgriPro]	851	1020	1204	3075
	Custer [OK FS]	531	879	1561	2970
	Deliver [OK FS]	566	976	1479	3021
	Doans [AgriPro]	944	1270	1561	3776
	Duster [OK FS]	757	1210	1448	3416
	Endurance [OK FS]	311	617	1514	2442
	Fannin [AgriPro]	1048	1241	1452	3741
	JEI 110 [Johnston]	473	897	1160	2531
	Jagger [OK FS]	756	1053	1169	2978
	Kingrazer (soft) [Andrews]	1116	1342	1364	3824
	Lockett [TAM FS]	364	685	1157	2207
	OK 101 [OK FS]	370	554	1252	2175
	OK 102 [OK FS]	274	418	1501	2193
	OK Bullet [OK FS]	891	828	1253	2972
	Overley [OK FS]	947	859	1158	2964
	Ranger Brand (soft) [MBS]	733	795	1503	3030
	Santa Fe [Johnston]	581	979	1329	2889
	Shocker [Johnston]	817	1040	1082	2939
	LSD	449	335	251	682

*Shaded numbers are not statistically different from the highest yielding entry within a column.

Table 4. Forage yield of commercial varieties of small grains at the Noble Foundation Red River Demonstration and Research Farm (RRF), Burneyville, Okla., harvested on Feb. 21, March 20 and April 10, 2007

		Harvest dates			
Crop	Variety [Source]	2/21	3/20	4/10	Sum
		lbs/ac			
Oats	Dallas [MBS]	1520*	2125	1323	4967
	Harrison [MBS]	1708	1565	727	4001
	Plot Spike [RM]	1772	1469	631	3872
	LSD	621	412	767	1229
Rye	Bates [OK FS]	1451	2838	364	4692
	Elbon [OK FS]	1724	2965	802	5492
	Maton [OK FS]	1517	3316	684	5517
	Maton II [Topco]	946	2645	469	4061
	Oklon [OK FS]	1405	3167	721	5292
	Wintergrazer 70 [Pennington]	1679	2442	312	4433
	LSD	1015	514	306	1050
Triticale	TAMcale 5019 [AgriPro]	1496	2606	312	4413
	TAMcale 6331 [AgriPro]	1695	2808	339	4842
	LSD	369	604	255	645
Wheat	2174 [OK FS]	780	1923	1110	3815
	Coker 9553 (soft) [AgriPro]	607	2392	540	3540
	Coker 9663 (soft) [AgriPro]	798	1737	539	3074
	Coronado [AgriPro]	1138	1991	534	3663
	Custer [OK FS]	1307	2630	696	4634
	Deliver [OK FS]	1252	2306	974	4533
	Doans [AgriPro]	1189	2161	792	4143
	Duster [OK FS]	1121	2605	642	4368
	Endurance [OK FS]	521	2345	1280	4146
	Fannin [AgriPro]	827	2127	385	3339
	JEI 110 [Johnston]	842	1654	825	3321
	Jagger [OK FS]	862	2125	392	3378
	Kingrazer (soft) [Andrews]	473	2058	672	3203
	Lockett [TAM FS]	986	2771	557	4314
	OK 101 [OK FS]	983	1556	947	3486
	OK 102 [OK FS]	521	1682	1239	3443
	OK Bullet [OK FS]	1048	1575	587	3209
	Overley [OK FS]	1176	1980	769	3924
	Ranger Brand (soft) [MBS]	889	2297	1305	4491
	Santa Fe [Johnston]	1083	2099	615	3797
	Shocker [Johnston]	1116	1814	630	3560
	LSD	713	613	367	1156

*Shaded numbers are not statistically different from the highest yielding entry within a column.

Appendix 1. Grain yield of commercial varieties of small grains at the Noble Foundation Headquarters Farm (HQF), Ardmore, and Red River Demonstration and Research Farm (RRF), Burneyville, harvested on June 6 and June 12, 2007, respectively

Crop	Variety [Source]	HQF Yield bu/ac	Test weight lbs/bu	RRF Yield bu/ac	Test weight lbs/bu
Oats	Dallas [MBS]	66.8	33.1	40.5	28.3
	Harrison [MBS]	58.3	35.2	58.9	33.0
	Plot Spike [RM]	84.3	34.6	56.1	31.1
	LSD	21.8	1.99	38.1	4.32
Rye	Bates [OK FS]	49.4	52.2	57.9	51.2
	Elbon [OK FS]	53.0	53.3	53.3	50.8
	Maton [OK FS]	56.1	53.4	47.6	50.7
	Maton II [Topco]	45.7	52.6	52.8	51.0
	Oklon [OK FS]	55.4	53.3	45.5	51.1
	Wintergrazer 70 [Pennington]	48.1	52.8	46.2	51.1
	LSD	8.56	1.26	11.1	1.27
Triticale	TAMcale 5019 [AgriPro]	47.3	48.8	57.4	44.2
	TAMcale 6331 [AgriPro]	52.4	47.1	55.4	44.8
	LSD	9.45	1.87	20.2	5.42
Wheat	2174 [OK FS]	47.7	59.6	45.2	56.8
	Coker 9553 (soft) [AgriPro]	73.3	59.4	46.5	58.8
	Coker 9663 (soft) [AgriPro]	56.6	55.7	55.1	55.1
	Coronado [AgriPro]	39.4	54.4	45.5	54.0
	Custer [OK FS]	46.4	58.1	54.7	55.6
	Deliver [OK FS]	36.1	57.3	62.6	57.9
	Doans [AgriPro]	42.9	59.4	52.4	55.0
	Duster [OK FS]	52.1	57.8	45.8	55.0
	Endurance [OK FS]	52.7	58.1	45.8	54.4
	Fannin [AgriPro]	50.4	58.7	59.6	57.2
	JEI 110 [Johnston]	45.6	55.4	39.5	56.6
	Jagger [OK FS]	43.5	55.5	56.2	56.2
	Kingrazer (soft) [Andrews]	65.1	58.9	42.3	55.9
	Lockett [TAM FS]	42.0	52.8	38.8	55.6
	OK 101 [OK FS]	34.6	56.3	50.4	55.9
	OK 102 [OK FS]	46.1	58.1	49.1	57.6
	OK Bullet [OK FS]	45.6	58.1	49.2	58.1
	Overley [OK FS]	51.3	56.0	49.4	56.3
	Ranger Brand (soft) [MBS]	45.5	55.1	54.0	55.8
	Santa Fe [Johnston]	52.9	57.2	45.1	56.6
	Shocker [Johnston]	47.3	54.9	47.5	55.3
	LSD	11.91	1.94	19.96	4.63

Appendix 2. Forage yield of advanced experimental lines of small grains at the Noble Foundation Headquarters Farm (HQ), Ardmore, Okla., harvested on Feb. 5, March 6 and April 5, 2007

		Harvest dates			
Crop	Variety [Source]	2/5	3/6	4/5	Sum
					lbs/ac
Barley	TX00D639 [TAM]	477	511	1302	2290
Oats	LA990165 [LSU]	1008	681	994	2683
	NF18 [NF]	1372	757	1066	3195
	NF27 [NF]	1723	718	1022	3464
	NF27A [NF]	1071	875	1120	3066
	NF95401 [NF]	1085	638	1089	2813
	NF95401A [NF]	963	831	1385	3179
	NF95414A [NF]	992	1004	1225	3221
	NF95418 [NF]	1092	993	1283	3367
	Tamo606 [TAM]	801	921	1412	3134
	LSD	369	282	300	587
Rye	Bates114 [NF]	1591	1403	1216	4210
	BatesRS4 [NF]	1750	1184	1168	4101
	NF95307A [NF]	2630	1339	912	4881
	NF95307B [NF]	1614	1175	1055	3843
	NF95318 [NF]	1570	1184	1054	3808
	NF95319B [NF]	1587	1260	884	3731
	NF95322C [NF]	1418	1349	1000	3767
	NF96321 [NF]	1468	1238	962	3668
	NF96322 [NF]	1635	1195	928	3758
	LSD	923	241	206	1021
Triticale	NF95215B [NF]	1023	1601	1233	3858
	NF96210 [NF]	1508	1936	1342	4785
	NF96213 [NF]	1680	1428	1058	4165
	NF97203 [NF]	973	1453	1164	3590
	NF97210A [NF]	2392	1255	883	4530
	NF97216 [NF]	1177	1669	1087	3933
	NF97226 [NF]	1562	1865	1148	4575
	LSD	839	353	223	891
Wheat	MBS327 [MBS]	1466	1285	1273	4024
	NF94120 [NF]	963	1310	1404	3678
	NF95134A [NF]	796	1062	1626	3484
	NF96107A [NF]	411	1503	1257	3171
	NF96131 [NF]	930	1232	1428	3590
	NF97109A [NF]	1297	1235	1153	3685
	LSD	449	335	251	682

Appendix 3. Forage yield of advanced experimental lines of small grains at the Noble Foundation Red River Demonstration and Research Farm (RRF), Burneyville, Okla., harvested on Feb. 21, March 20 and April 10, 2007

		Harvest dates			
Crop	Variety [Source]	2/21	3/20	4/10	Sum
					lbs/ac
Barley	TX00D639 [TAM]	1813	1869	949	4631
Oats	LA990165 [LSU]	1846	1672	854	4372
	NF18 [NF]	2034	1572	879	4485
	NF27 [NF]	1513	2048	745	4307
	NF27A [NF]	1497	1556	928	3980
	NF95401 [NF]	2280	1594	1020	4894
	NF95401A [NF]	1526	1859	1527	4912
	NF95414A [NF]	1487	1899	927	4313
	NF95418 [NF]	1731	2103	1022	4857
	Tamo606 [TAM]	2155	1930	978	5063
	LSD	369	282	300	1229
Rye	Bates114 [NF]	1198	2764	424	4386
	BatesRS4 [NF]	811	2626	305	3743
	NF95307A [NF]	1177	2748	300	4225
	NF95307B [NF]	1737	2426	280	4443
	NF95318 [NF]	913	2724	321	3958
	NF95319B [NF]	1246	2860	435	4541
	NF95322C [NF]	734	2729	455	3918
	NF96321 [NF]	1685	2614	427	4727
	NF96322 [NF]	1735	2239	269	4243
	LSD	923	241	206	1051
Triticale	NF95215B [NF]	1306	2692	198	4196
	NF96210 [NF]	1481	2761	246	4488
	NF96213 [NF]	1462	2584	488	4534
	NF97203 [NF]	1201	2293	443	3937
	NF97210A [NF]	1534	2031	210	3775
	NF97216 [NF]	855	2508	341	3703
	NF97226 [NF]	1444	3132	344	4920
	LSD	839	353	223	645
Wheat	MBS327 [MBS]	1246	2020	696	3962
	NF94120 [NF]	1097	2391	427	3914
	NF95134A [NF]	913	2481	519	3914
	NF96107A [NF]	1191	2991	172	4353
	NF96131 [NF]	1458	2890	692	5041
	NF97109A [NF]	1094	1426	687	3208
	LSD	449	335	251	1156

Appendix 4. Grain yield of advanced experimental lines of small grains at the Noble Foundation Headquarters Farm (HQF), Ardmore, and Red River Demonstration and Research Farm (RRF), Burneyville, harvested on June 6 and June 12, 2007, respectively

Crop	Variety [Source]	HQF Yield bu/ac	Test weight lbs/bu	RRF Yield bu/ac	Test weight lbs/bu
Barley	TX00D639 [TAM]	29.2	52.9	17.4	53.8
Oats	LA990165 [LSU]	73.6	36.7	58.9	30.4
	NF18 [NF]	42.6	34.0	48.2	31.5
	NF27 [NF]	38.7	35.5	61.9	31.8
	NF27A [NF]	48.3	35.6	46.2	33.6
	NF95401 [NF]	60.7	31.0	39.3	29.4
	NF95401A [NF]	53.2	29.7	55.2	33.1
	NF95414A [NF]	48.7	33.4	61.2	26.8
	NF95418 [NF]	33.9	36.3	49.6	28.1
	Tamo606 [TAM]	62.6	33.7	42.3	28.5
	LSD	21.8	1.99	38.1	4.32
Rye	Bates114 [NF]	53.8	52.7	54.7	50.7
	BatesRS4 [NF]	49.5	52.1	51.3	50.8
	NF95307A [NF]	49.9	52.4	48.7	51.0
	NF95307B [NF]	53.7	52.0	60.1	49.2
	NF95318 [NF]	48.8	52.8	51.4	51.5
	NF95319B [NF]	55.4	52.2	54.4	50.8
	NF95322C [NF]	46.3	52.6	56.9	51.2
	NF96321 [NF]	46.9	52.7	51.5	50.9
	NF96322 [NF]	45.5	52.9	50.2	51.4
	LSD	8.56	1.26	11.1	1.27
Triticale	NF95215B [NF]	51.4	45.0	61.1	45.7
	NF96210 [NF]	53.4	46.1	54.0	44.8
	NF96213 [NF]	57.7	46.4	52.3	45.3
	NF97203 [NF]	45.0	45.8	48.3	46.4
	NF97210A [NF]	57.3	45.2	45.1	48.6
	NF97216 [NF]	60.2	45.0	65.5	44.1
	NF97226 [NF]	46.5	47.9	58.0	45.5
	LSD	9.45	1.87	20.2	5.42
Wheat	MBS327 [MBS]	60.2	56.9	36.7	55.5
	NF94120 [NF]	48.1	57.4	33.4	50.6
	NF95134A [NF]	52.0	56.1	43.1	55.4
	NF96107A [NF]	49.8	58.7	36.9	52.7
	NF96131 [NF]	47.2	56.1	41.2	54.5
	NF97109A [NF]	43.1	55.7	49.3	57.1
	LSD	11.91	1.94	19.96	4.63