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RYEGRASS AND SMALL GRAIN FORAGE CULTIVAR TRIALS AT BRYAN, TEXAS FOR 1993-94

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Summary

Selected ryegrass (*Lolium multiflorum* Lam.), oat (*Avena sativa* L.), wheat (*Triticum aestivum* L.), and rye (*Secale cereale* L.) cultivars were evaluated for winter forage production at Bryan, Texas during the winter of 1993-94. Forage yields were below normal due to dry conditions in March and April. The ryegrass cultivars yielded an average of 5256 lb/acre with no significant ($P < 0.05$) differences among cultivars. Total yields for the small grains averaged 4001 lb/acre. For the small grains, rye had the highest fall production, however due to a mild winter there were few differences among species for winter production. A mixture of oats and ryegrass yielded intermediate to its pure seeded components.

Introduction

Oats, wheat, rye, and ryegrass are commonly used for winter pasture in Texas. Due to the greater frost tolerance of ryegrass than oats, producers often seed these two species in a mixture. At Bryan, Texas (Van Esbroeck et al. 1993a, 1993b) ryegrass has consistently produced higher yields than small grains. Rankings between species or among varieties within species frequently vary from year to year due to differential responses to disease, cold or drought. This study was conducted as part of continuing efforts to determine the yields and yield distribution of commercially available and experimental small grain and ryegrass forage cultivars.

Procedure

Forage type small grain (wheat, oats, rye) and ryegrass cultivars were evaluated for winter forage production at Bryan, Texas during the 1993-94 growing season. The trials were located in Brazos county on a Lufkin fine sandy loam with a pH of 6.8. All cultivars were seeded on 5 October into a prepared seedbed with a seeding rate of 100 lb/acre for the small grains and 25 lb/acre for ryegrass. A mixture of 70 lb/acre 'Bob' oats and 20 lb/acre 'Southern Star' ryegrass was also included. Individual plots were 5 by 20 ft with a 7-inch row spacing and arranged in a randomized complete

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block design with four replications. The small grain and ryegrass varieties were grouped separately in each replicate. Prior to seeding, 75 lb/acre of N, P₂O₅ and K₂O as 13-13-13 were incorporated into to soil. All plots received an additional 60 lb/acre N as 34-0-0 on 14 February and 23 March. Plots were clipped four or five times at a cutting height of 2.5 inches and dry matter yields determined from a 3 by 17 ft strip. Dry matter yields were calculated from the fresh weight and the dry matter percentage of a subsample dried at 140 °F for 48 hr. Analysis of variance was carried out for each harvest and season total for the small grain and ryegrass trials. Fisher's protected LSD was carried out (P<0.05) to detect treatment differences. Cultivars were grouped into species and non-orthogonal contrasts (P<0.05) were carried out to compare the species means.

Results and Discussion

Precipitation was near normal from October to February, but was 62% below normal during March and April. A low temperature of 20 °F occurred on 27 November, but did not result in any frost damage. Temperatures during December through February were 2 °F above normal. No serious disease problems were encountered. 'Elbon' rye, 'Coronado' oats, and 'Tamo 386' oats provided the most forage at the 10 December clipping. Although rye is considered to be the most cold tolerant of the small grains, several oat cultivars and 87w7003 wheat had greater winter production as indicated by the yields on 7 February. This result was probably due to the mild winter conditions. The total yields of small grains averaged 4001 lb/acre (Table 1), which was 38% less than the previous three year average at this site. Low spring precipitation and subsequent low yields at the April harvest appear to account for these below average yields. 'AC 833' oats had the highest numerical yield, but was statistically superior to only 'Mitt' wheat (Table 1). Variation in temperature and moisture from year to year appears to have a major impact on the relative performance of cultivars and species at this site. No species or cultivar has been able to consistently produce the highest yields.

Ryegrass total yields averaged 5256 lb/acre with no significant differences among cultivars (Table 2). These yields were below average due poor spring growth attributable to the limited precipitation. 'Gulf', 'Tam 90' and 'Beefbuilder' had the highest yields on 7 February indicating good winter productivity. The mixture of oats and ryegrass yielded 701 lb/acre higher than Bob oats but was below average when compared to the ryegrass cultivars.

Figure 1 presents the mean yields for each species at all harvests. Wheat had the lowest fall yields and rye the highest, however, there was often as much variability within a species as among

species. For example, despite the fact that rye had the highest fall yields, Coronado oats had yields statistically similar to rye. Ryegrass had the highest total yields as a result of greater March yields and an additional harvest obtained in May. Late fall and early winter growth, represented by first harvest yields, for the past four years at this site was similar for small grains and ryegrass with yields of 1909 lb/acre and 1918 lb/acre respectively. Four year average total annual yields were greater for ryegrass (8504 lb/acre) than small grains (6455 lb/acre) due to greater spring production. At the Bryan location when ryegrass was planted on a prepared seedbed it was equivalent to small grains for winter production and had higher overall yields.

Literature Cited

Van Esbroeck, G., S.S. Simecek, D.H. Bade, and M.A. Hussey. 1993a. Performance of wheat, oat and rye, and triticale trials in Bryan, Texas, 1990-93. p. 21-22 *In* Forage research in Texas 1993. Texas Agri. Exp. Stn. PR-5085.

Van Esbroeck, G., S.S. Simecek, D.H. Bade, and M.A. Hussey. 1993b. Performance of annual italian ryegrass trials in Bryan, Texas, 1990-93. p. 23-24 *In* Forage research in Texas 1993. Texas Agri. Exp. Stn. PR-5086.

Table 1. Oat, rye, and wheat forage cultivar yields at Bryan, Texas 1993-94

Cultivar	Harvest				Total
	10 Dec.	7 Feb.	14 Mar.	11 Apr.	
	-----lb/acre-----				
AC 833 oats	737	1410	1154	1105	4405
87w7003 wheat	640	1669	1276	800	4385
TAMO 393 oats	843	1147	1406	889	4283
Bob oats	728	1420	836	1258	4241
AC 811 oats	520	1640	661	1277	4097
Coronado oats	1149	1069	868	980	4066
Elbon rye	1274	1092	920	691	3978
TAMO 386 oats	916	1021	940	1038	3915
RSI 220 wheat	604	911	1686	708	3909
TAMO 38 oats	777	1308	770	948	3803
Mitt wheat	361	1057	933	581	2932
mean	777	1249	1041	934	4001
CV (%)	32	17	23	18	13
LSD (0.05)	364	302	347	237	730

Table 2. Annual Italian ryegrass forage cultivar yields at Bryan, Texas 1993-94

Cultivar	Harvest Date					Total
	10 Dec.	7 Feb.	14 Mar.	11 Apr.	8 May	
	-----lb/acre-----					
Gulf	1098	1524	1798	1115	696	6231
TAM 90	988	1502	1774	914	672	5850
Rustmaster	800	1018	1820	930	691	5259
Beef builder	797	1330	1715	999	410	5252
Surrey	772	839	1865	901	758	5135
Jackson	828	796	1738	938	834	5133
Marshall	757	581	1436	1511	695	4979
Tetra Gold	545	1016	1737	1170	509	4977
Oats + ryegrass	943	1092	1419	899	588	4942
Southern Star	924	742	1521	1015	609	4809
mean	856	1038	1676	1044	646	5256
CV (%)	21	31	15	19	34	12
LSD (0.05)	NS	469	NS	298	NS	NS

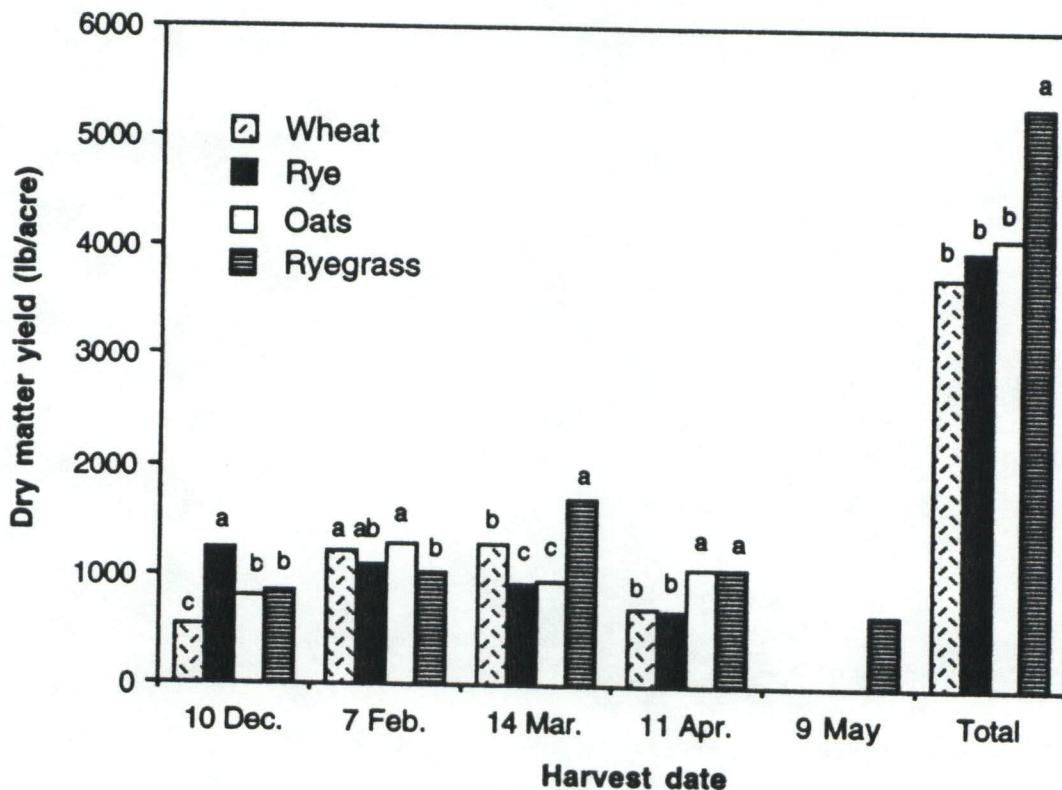


Figure 1. Yield distribution of oats, wheat, rye and ryegrass at Bryan, Texas during 1993-94. Means within a harvest date with similar letters are not significantly ($P < 0.05$) different according to non-orthogonal contrasts.