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Alfalfa Variety Trials—Yoakum 1984-85 and 1985-86

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Summary

Sixteen alfalfa cultivars have been tested under rainfed conditions at the Texas A&M University Agricultural Research Station at Yoakum since fall 1984. While there have been substantial ranges in yields, the degree of variation among replications have been great. This has resulted in no statistical differences for some harvest periods or broad groupings of cultivars by Duncan's Multiple Range Test. However, performance of most cultivars appear to be acceptable. Harvests will be continued this crop year, allowing a 3-year assessment of adaptation and performance.

Introduction

Alfalfa acreage in the South Central, Coastal Bend, and Upper Coast Texas Crop Reporting Districts is very small. Only 2,000 of the 442,000 acres of hay reported in the South Central District in 1985 were alfalfa, and 1,000 of 95,000 acres of hay in the Upper Coast were alfalfa. The Coastal Bend district acreage was too small to report.

Alfalfa production is frequently viewed as intensive, high yielding, and usually irrigated production which is viable only if stands remain for decades. While biological and environmental stresses may not allow the high production levels or stand persistence seen in some regions, much of the southern half of Texas may support rainfed alfalfa for hay or grazing at more modest levels of both productivity and production costs. As an initial step in determining the feasibility of such production, we initiated a variety trial in fall 1984 to assess production and persistence of selected alfalfa cultivars at the TAMU Agricultural Research Station at Yoakum.

Procedure

Sixteen alfalfa cultivars were planted November 29, 1984 at a seeding rate of 19 lbs/A. The seed were obtained from the Regional Plant Introduction Station at Experiment, Georgia. Prior to planting all seed was inoculated with the appropriate rhizobium using the Pelgel method. The experimental site is located on the TAMU Agricultural Research Station at Yoakum in Lavaca County. The soil is in the Denhawken-Elmendorf complex (Fine, montmorillonitic, hyperthermic Vertic Ustochrepts), has a high clay content, and is moderately alkaline (pH 8). Plots are 15-ft long and 12-ft wide. The experimental design is a randomized complete block with four replications.

The test was planted on a prepared seedbed in which Balan (4 qt/A) had been incorporated. The seed were distributed over the plot area by hand and rolled with a "culti-packer." Cultural practices have included: 1/25/85—fertilized with 150 lbs/A 0-46-0; 6/28/85—hoed for weed control; 11/6/85—fertilized with 150 lbs/A 0-46-0; and 11/20/86—fertilized with 150 lbs/A 0-46-0. The plots have not been irrigated.

Yield sampling areas are 15 ft X 4 ft and are harvested with a Lawn Genie flail mower equipped with a catcher. In the harvesting protocol, the fresh forage is cut, dumped onto a tarp, and weighed on a milk scale tared for the tarp. A moisture sample is collected and stored in a closed plastic bag. The moisture sample is weighed wet, transferred to a cloth bag, and dried with heated, forced-air. The dry forage is weighed and percent dry matter calculated to convert the plot fresh weight to weight of dry forage. A quadrat was hand-harvested from a representative site in each plot to correct for any weeds or grass in the sample weight. Data were analyzed using analysis of variance (ANOVA) and Duncan's Multiple Range (DMR) procedures of the Statistical Analysis System.

During the first year of the test, intervals between harvest dates were probably longer than desirable. In the second year, we harvested at approximately 10 percent bloom; this worked out to an approximately 40-day interval during good growing conditions. Cutting height was normally 4 inches, except for the last harvest in 1985 which was cut at 6 inches to minimize possible stress from the late harvest.

Plots have also been rated for stand density and rust infestation, but the data is not presented in this report. The stands for Florida 77 and Hy-Phy are substantially less dense than other cultivars, which may be related to their relatively poor performance.

Results and Discussion

During the first harvest season, yields were significantly different among cultivars only in the third harvest (Table 1). The average yield of dry alfalfa was 2,448 lbs/A for the first clipping (June 4); 1,624 for the second cutting (July 2); 1,057 for the third cutting (July 30); and 600 for the fourth cutting (December 5). The average seasonal yield for 1985 was 5,729 lbs of dry forage per acre. Even in the third cutting, which had statistically significant variation among cultivars, the DMR groupings were large. The highest yielding group included 13 of the 16 cultivars.

Harvest dates in 1986 were March 24, April 30, June 11, July 10, September 11, and December 4. Yields were significantly different among cultivars for the second, third, and fourth cuttings and for the annual totals (Table 2). Annual dry forage production ranged from 6,812 lbs/A for Hy-Phy to 10,556 lbs/A for Apollo. Again, the DMR groups were large with the highest yielding group including 14 of the 16 cultivars tested.

In both years, WL 318, Apollo, Raidor, Cal West 481, and Cimarron were among the eight highest-yielding cultivars; and Florida 77 and Hy-Phy tended to be relatively low-yielding. As previously stated, the stands of the two lower-yielding cultivars were relatively thin.

It should be noted that while the yield figures presented indicate relative performance, they are probably over-

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estimates of what a producer would actually obtain, especially in hay production. There are two reasons for believing this to be true: (1) end-of-row effects in the small plots increase plot weights; and (2) we have no leaf loss from air drying as would occur in normal hay production.

Initial observations indicate that even under conditions of summer drought, production and stand survival has been acceptable for the alfalfa cultivars tested. There have been no severe disease or insect problems. Rust was found in the plots this spring, but it did not appear to cause much damage. Harvesting and observation of plots are continuing this growing season. Following this season, yield trends for the 3 years will be analyzed and some estimates of the biological and economic potential of alfalfa made for this area.

Literature Cited

1. 1985 Texas County Statistics. Texas Agricultural Statistics Service. Texas Department of Agriculture and U.S. Department of Agriculture.

TABLE 1. ALFALFA VARIETY TRIAL AT YOAKUM, TEXAS 1984-85

Variety	First Harvest	Second Harvest	Third Harvest	Fourth Harvest	Total lbs/A
WL 318	2,890	2,354	1,308 ab*	651	7,203
RAIDOR	2,822	1,886	1,529 a	839	7,076
APOLLO	2,889	1,899	1,561 a	603	6,952
CAL WEST 481	2,905	1,787	967 abc	868	6,527
CLASSIC	2,762	1,903	1,235 ab	624	6,524
CIMARRON	2,620	1,713	1,143 abc	625	6,101
PIONEER 532	2,223	1,996	1,254 ab	544	6,017
BARON	2,523	1,614	948 abc	570	5,655
PIONEER 526	2,395	1,693	1,057 abc	472	5,617
SHENANDOAH	2,378	1,713	970 abc	475	5,536
SOUTHERN SPECIAL	2,234	1,613	1,029 abc	617	5,493
ARMOR	2,041	1,723	1,093 abc	482	5,339
CAL WEST 475	2,169	1,469	1,087 abc	562	5,287
VANCOR	2,625	1,210	741 bc	423	4,999
FLORIDA 77	1,964	627	505 c	947	4,043
HY-PHY	1,733	789	485 c	305	3,312
MEAN	2,448	1,624	1,057	600	5,729
F-TEST	P=40%	P=18%	P=1%	P=63%	P=16%

*Means in each column followed by the same letter are not signficantly different at the 5% probability level as indicated by Duncan's Multiple Range Test.

TABLE 2. ALFALFA VARIETY TRIAL AT YOAKUM, TEXAS 1985-1986

Variety	First Harvest	Second Harvest	Third Harvest	Fourth Harvest	Fifth Harvest	Sixth Harvest	Total lbs/A
Apollo	2,033	1,273 ab*	2,687 a	2,384 a	999	1,180	10,556 a
Cal West 475	2,582	1,251 abc	1,734 bc	2,341 a	903	1,407	10,217 a
Cal West 481	1,979	1,373 a	1,936 b	2,453 a	966	1,423	10,130 a
Shenandoah	2,348	986 abcde	2,035 b	2,071 ab	875	1,673	9,987 ab
WL 318	1,997	1,073 abcde	2,066 b	2,235 ab	908	1,410	9,689 ab
Pioneer 526	2,215	1,063 abcde	1,847 bc	2,177 ab	907	1,464	9,672 ab
Raidor	1,950	909 cde	1,984 b	2,545 a	962	1,241	9,591 ab
Cimarron	2,268	940 cde	1,688 bc	2,052 ab	813	1,370	9,131 abc
Baron	1,962	1,188 abcd	1,712 bc	2,019 ab	848	1,289	9,017 abc
Pioneer 532	1,859	1,071 abcde	1,712 bc	2,231 ab	969	1,129	8,970 abc
Classic	1,739	850 de	1,670 bc	2,176 ab	952	1,543	8,929 abc
Armor	1,666	1,024 abcde	1,632 bc	1,968 ab	908	1,716	8,914 abc
Southern Special	1,841	1,030 abcde	1,528 bc	2,105 ab	843	1,065	8,412 abc
Vancor	2,235	860 cde	1,475 bc	1,709 bc	873	1,130	8,280 abc
Florida 77	1,672	967 bcde	1,281 c	1,700 bc	864	1,119	7,603 bc
Hy-Phy	1,698	682 e	1,209 c	1,293 c	776	1,155	6,812 c
Mean	2,003	1,034	1,762	2,091	898	1,332	9,119
F-Test	P=42%	P=1%	P=0.1%	P=0.1%	P=84%	P=74%	P=4%

*Means in each column followed by the same letter are not significantly different at the 5% probability level as indicated by Duncan's Multiple Range Test.