

Forage Research in Texas

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Evaluation of Alfalfa Cultivars for Hay Production

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SUMMARY

Fourteen alfalfa varieties were evaluated for yield during a three-year period in the Brazos River bottom near College Station. Several varieties averaged over 6 tons production per acre over the three-year period even though two cuttings were lost because of insect damage. Alfalfa weevil and fall army worm were the insects causing the most damage.

Introduction

Alfalfa is recognized as the "Queen of Hay" plants because of its high level of potential production and excellent forage quality. Alfalfa is best adapted to deep, fertile, well-drained soils. While alfalfa is drought resistant in terms of plant survival, it requires large amounts of water for maximum production. Approximately 80% of the acreage grown for hay in Texas is found in the High Plains, Rolling Plains, and Trans-Pecos areas. The remaining acreages are largely in the Red, Brazos, and Rio Grande River bottoms. The High Plains, Trans Pecos, and Rio Grande River bottom acreages are essentially all irrigated. Average hay yield is about 4.7 tons per acre, ranging from less than 3 tons to more than 6 tons.

Experimental Procedure

The varieties listed in Table 2 were planted October 13, 1977 on alluvial Miller clay soil at College Station (Brazos River-bottom). Seeding rate was 15 pounds of seed per acre. Plots consisted of 5 12-inch rows, 20 feet long, replicated 5 times. Harvests were made in the early bloom stage except when delayed by rainfall. The plot area received 0-60-0 fertilizer at planting, April 1979 and April 1980. Approximately 3 acre inches of irrigation water were applied each on June 21 and August 15, 1978, July 3 and July 9, 1979. Rainfall recorded near the test site at College Station is shown in Table 1.

Results and Discussion

Alfalfa planted in the fall of 1977 at College Station produced 2 tons of hay per acre by the following May (Table 2). Four cuttings were harvested each in 1978 and 1979 and 3 cuttings in 1980. Regrowth following the August 1979 harvest was defoliated by fall army worms and not harvested. Similarly, the first growth in 1980 which should have been harvested in late April was defoliated by the Alfalfa weevil during a rainy period when we could not get into the field to control the insect.

KEYWORDS: Alfalfa varieties, hay yield, insect damage.

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There were no significant differences among varieties in production during the three-year period. Yield per cutting was as high in 1980 as in 1978. Yield per year was down in the third year but due to the loss of one cutting from insect damage which did not occur in 1978. Also, rainfall was very limited in 1980 and no irrigation water was applied.

There is some indication that some varieties were losing vigor while others were not. Arc increased in yield each year while Mesilla and Williamsburg decreased each year. The difference between Arc and each of the two decreasers showed a significant ($P < 0.05$) linear relationship. Stands of all cultivars in the spring of 1981 appeared to be satisfactory for production.

Insects are a major problem at times in alfalfa production, fall army worms and alfalfa weevil referred to previously being specific examples. Both are controllable with insecticides but require close monitoring because excessive damage can occur within short periods. Alfalfa cultivars are available that are resistant to one or more of the following insects: alfalfa weevil, spotted alfalfa aphid, pea aphid, and potato leaf hopper. However, insecticides to control alfalfa weevil may be necessary at times even with resistant varieties.

Inadequate soil moisture may severely restrict alfalfa yields at times. Apparently this was the reason for the lack of a fall cutting in 1980. There was essentially no effective rainfall from May until September 8. Only erratic regrowth occurred after the August 1 harvest. Recovery was poor after early September rainfall until after the first of October. Conditions did not permit the late fall growth to reach the bloom stage.

The data in this report indicate that alfalfa with adequate insect control will produce in excess of 5 tons of hay annually and that stands may be expected to persist three or more years under most conditions in the Brazos River bottom. The performance of additional varieties in the Brazos River bottom has been reported by Holt (1). Less drought stress was encountered in the earlier study, and yields ranged from 5 to 8 tons per acre over a three-year period.

Literature cited

Holt, Ethan C. 1978. Evaluation of alfalfa varieties for hay production. Texas Agric. Exp. Sta. PR-3481. 6 P.

Table 1. Rainfall during the growing season, University Farm, Burleson County, near College Station

Month	Rainfall in inches		
	1978	1979	1980
March	2.72	4.77	5.63
April	1.62	3.93	1.44
May	2.49	9.23	5.97
June	3.85	1.13	.61
July	.87	5.01	.38
August	.45	1.12	.20
September	7.56	1.30	3.97
October	3.18	1.30	3.22

TABLE 2. HAY PRODUCTION OF ALFALFA CULTIVARS, BRAZOS RIVER BOTTOM, BURLISON COUNTY, NEAR COLLEGE STATION

Cultivar	1978							1979					1980			Total	Average per cutting ²
	May 16	June 21	July 18	Sept 26	Total	April 25	June 22	July 23	Aug 28	Total	June 2	June 28	Aug 1	Aug 1	Total		
1 Arc	4520	3100	2290	1780	11690	2690	4220	3200	2560	12670	6230	2510	2040		10780	3195	
2 Olympic	4650	4430	2550	1910	13540	2310	4690	3220	2440	12660	5450	2760	1510		10020	3293	
3 Kan 2A	4130	3940	2560	2080	12710	1400	3960	3040	2610	11010	5440	2720	2040		10200	3084	
4 NAP B42	4830	4160	2640	2010	13640	2260	4630	3320	2470	12680	5590	2570	1810		9970	3299	
5 Saranac	3810	4330	2150	1840	12130	1820	4130	2940	2720	11510	5010	2440	1830		9280	3002	
6 WL512	4360	3960	2740	2020	13080	1420	3560	2910	2860	10750	4520	2620	2090		9230	3006	
7 Apollo	4260	4050	2750	2120	13180	1910	4760	2830	2190	11690	5360	2780	2260		10400	3206	
8 Team	4460	4000	2330	1970	12760	2880	4460	3360	2450	13150	5820	2680	1730		10230	3268	
9 Williamsburg	4210	4320	2110	1890	12530	1780	4310	3300	2690	12080	4450	2390	1780		8620	3021	
10 Dawson	3770	4050	2360	1770	11950	1920	5180	3010	2320	12430	4570	2170	1870		8610	2999	
11 WL318	4390	4460	2540	1190	13290	2140	3830	3170	2810	11950	5170	2730	2270		10170	3219	
12 Zia	3620	4120	2730	1910	12380	1650	4310	2870	2770	11600	4740	2650	1840		9230	3019	
13 Mesilla	4370	3970	2530	2180	13050	1330	3880	2900	2430	10540	3460	2660	2020		8140	2885	
14 Mosopa	3760	4130	3000	2070	12960	1180	3470	2990	2740	10380	4700	2560	2190		9450	2981	

¹ Pounds dry forage per acre

² Values not significantly different (P<0.05)