Third-Year Performance of Alfalfa Cultivars in the Semi-Arid Subtropics of the Lower Rio Grande Valley

R. P. Wiedenfeld

Summary

Third-year alfalfa yields at Weslaco averaged 12,340 lbs DM/A in 1988 which was above second-year but below first-year yields. The range in yields between the highest and lowest cultivars was larger than in previous years indicating that certain cultivars had better survival, but experimental variability was also large reducing statistical significance. Thinning of stand and die-out in patches occurred probably caused by disease or physiological stress on the aging plants.

Introduction

Alfalfa (*Medicago sativa* L.) is a very attractive crop for growers because it produces a very palatable, high protein forage. The Lower Rio Grande Valley of Texas has medium textured, well-drained soils with high pH's suitable for this crop (Evers and Dorsett 1986); but alfalfa's sensitivity to cotton root rot and other diseases resulting from this humid environment, are thought to limit its potential in this area. Good alfalfa yields have been reported in other humid environments in Texas; and in the Lower Rio Grande Valley annual yields have ranged from 14,900 to 16,700 and 8,500 to 12,600 lbs DM/A for first- and second-year crops, respectively (Wiedenfeld 1987, Wiedenfeld 1988). These cultivars have shown good production for 2 years, but the question remains how long will they continue to thrive under South Texas conditions. This study was conducted to evaluate third-year alfalfa performance under the semi-arid subtropical conditions of the Lower Rio Grande Valley and to compare yields for several commercial cultivars under these conditions.

Procedures

A field study was conducted at the Texas A&M Research and Extension Center at Weslaco on a Willacy fine sandy loam soil (Udic Agriustoll). Twelve alfalfa cultivars were planted in 10 x 20-ft plots in a randomized block design with three replications. Planting was done on October 31, 1985 on a tilled seedbed by hand broadcasting inoculated seed at the rate of 30 lbs/A, then raking, followed by flood irrigation. No further fertilization, pesticide application, or irrigation has been applied. Yields were determined at early bloom stage using a flail-type harvester and a subsample was dried to convert yields to dry weight. First- and second-year alfalfa yields for this field study have been reported previously.

Results

The alfalfa field study at Weslaco was harvested nine times in its third year during 1988. Rainfall distribution in 1988 (Fig. 1) was good for alfalfa with a wet late winter, below normal spring and good summer rain. This resulted in frequent cuttings but below normal yield per cutting. Overall third-year alfalfa dry matter yields averaged 12,340 lbs/A (Table 1) which was above second-year yields but below first-year yields. There was also a wide range in third-year alfalfa yields between cultivars, with the lowest yielding cultivar producing only about 58% as much as the highest yielding cultivar. However, there was also a great deal of variability between replications as well, caused by loss of stand and patches of decline probably due to moisture stress or pest outbreaks. Thus, differences between cultivars show little statistical significance.

Observations on the overall study during the year again indicated the importance of moisture availability on alfalfa production. Plants appeared to be dead during dry periods yet most recovered and grew vigorously when rainfall was received. However, the stand did appear to be thinning out with more plants failing to recover after each rainfall. Disease

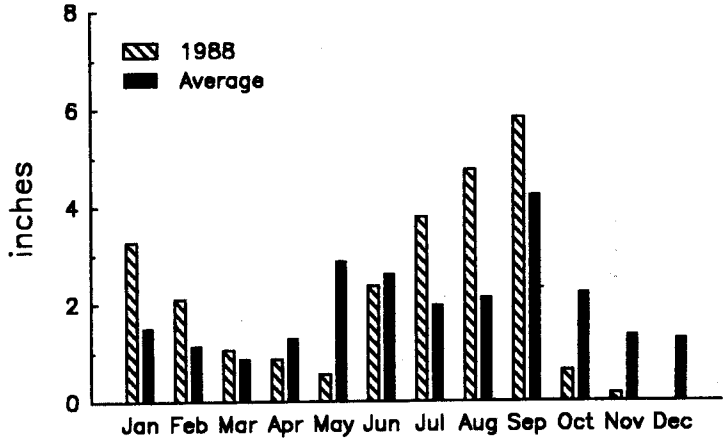

Figure 1. Monthly rainfall total in Weslaco for 1988 and 73-year average.

TABLE 1. DRY MATTER YIELD OF ALFALFA CULTIVARS IN THEIR THIRD YEAR IN THE LOWER RIO GRANDE VALLEY OF TEXAS, 1988.

Cultivar	Date of Harvest									Total
	Feb. 18	Apr. 5	May 9	June 6	June 30	Aug. 12	Sept. 13	Oct. 7	Nov. 11	
	lbs/A									
CUF-101[1]	1,762	2,172	3,029a[6]	1,389	1,480	1,401	2,150a	1,304	573	15,260
Pierce[2]	1,634	2,151	2,803ab	1,193	1,535	1,443	2,007abc	1,392	653	14,811
P5929[3]	1,758	1,791	2,647ab	1,322	1,323	1,599	2,047ab	1,306	652	14,446
Southern Special[4]	1,652	2,034	2,542ab	1,487	1,240	1,561	1,774abc	1,053	251	13,593
WL-83T57-2[4]	1,625	2,257	2,362ab	963	1,084	1,291	2,191a	1,288	440	13,500
Valador[2]	1,460	2,031	2,302ab	1,064	1,133	1,191	1,943abc	1,128	351	12,602
WL-83T51[4]	1,658	2,054	2,385ab	985	1,200	1,090	1,759abc	1,033	355	12,518
Cibola[1]	1,324	1,571	1,969ab	909	1,220	1,473	1,532abc	1,265	509	11,772
Baron[5]	1,556	1,791	1,876ab	770	781	939	1,417 bc	1,050	305	10,486
Granada[5]	1,487	1,774	2,127ab	786	984	769	1,322 c	848	235	10,331
NAPB-29[5]	1,056	1,570	1,689ab	535	669	821	1,676abc	1,364	570	9,950
Florida-77[3]	1,310	1,376	1,618 b	477	438	679	1,723abc	975	264	8,860

[1]University of California.
[2]Northrup King.
[3]Pioneer Hi-Bred.
[4]WL Company.
[5]North American Plant Breeders.
[6]Means in each column followed by the same letter are not statistically different at the 5% confidence level according to Duncan's Multiple Range Test. Where no letters follow means, differences were not statistically significant.

pressure could well have taken its toll in this third year of production. With the thinning stand, weed infestations became more of a problem, particularly in the early winter when lack of rainfall caused alfalfa to stop growing.

Literature Cited

1. Evers, G. W. and D. J. Dorsett. 1986. Forage Legumes in Texas. Texas Agri. Exp. Sta. MP-1610.
2. Wiedenfeld, R.P. 1987. First-year performance of alfalfa cultivars in the semi-arid subtropics of the Lower Rio Grande Valley. p. 37-38. *In*: Forage Research in Texas, 1987. Texas Agri. Exp. Sta. CPR-4537.
3. Wiedenfeld, R.P. 1988. Second-year performance of alfalfa cultivars in the Semi-arid subtropics of the Lower Rio Grande Valley. p. 37-38. *In*: Forage Research in Texas, 1988. Texas Agri. Exp. Sta. CPR-4593.