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

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Abstract

First-year alfalfa yields at Weslaco averaged better than 16,000 lbs dry weight/A in 1986, and no statistically significant differences between cultivars were found. No differences in stand density, plant height, degree of flowering or rust susceptibility were found between cultivars as well. Moisture availability strongly limited plant growth, but the crop was quick to recover and respond when rainfall was received.

Introduction

Alfalfa (*Medicago sativa* L.) is particularly appealing to growers because it produces a very palatable, high protein forage. The Lower Rio Grande Valley of Texas has the medium textured well-drained soils with higher pHs suitable for this crop (Evers and Dorsett, 1986), but alfalfa's extreme sensitivity to cotton root rot is thought to limit its potential in this area. Cultivar performance trials further north in Texas have reported good first-year alfalfa yields at Angleton (Evers 1985), College Station (Holt and Simecek, 1985), and Overton (Smith and Gilbert, 1985). This study was conducted to determine what constraints would be encountered in alfalfa production in a subtropical semi-arid environment, and to compare yields for several commercial alfalfa cultivars under these conditions.

Procedures

A field study was established on the Texas A&M Center at Weslaco on a Willacy fine sandy loam soil (Udic Argis-

toll). Twelve alfalfa cultivars were planted in 10- X 20-ft plots in a randomized block design with three replications. Planting was done on 31 Oct 1985 on a rotovated seed bed by hand broadcasting inoculated seed at the rate of 30 lbs/A, then racking, followed by flood irrigation. No further fertilization, pesticide application, or irrigation was applied. Yields were determined at early bloom stage using a flail-type harvester, and a subsample was dried to convert yields to dry weight.

Results

The alfalfa field study at Weslaco was harvested seven times in 1986 due primarily to good rainfall amount and distribution (Fig. 1). Total yields averaged better than 16,000 lbs dry weight/A, and there were no statistically significant differences between cultivars (Table 1). Observations made for each plot just before the first harvest showed no differences between cultivars in stand density, plant height and degree of flowering, although there was

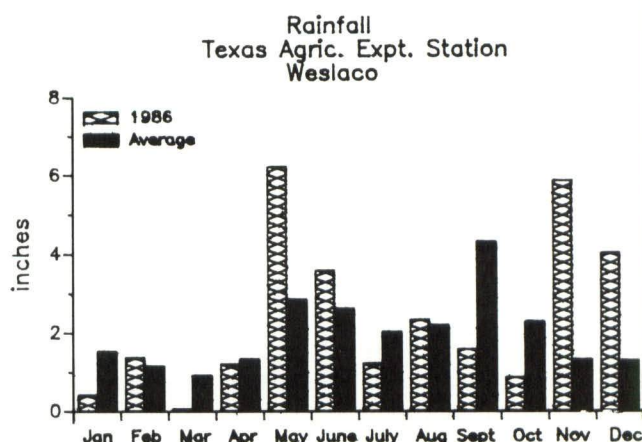


Figure 1. Monthly rainfall total at Weslaco for 1986 and 71-year average.

TABLE 1. YIELD OF ALFALFA CULTIVARS IN THE LOWER RIO GRANDE VALLEY, 1986

Cultivar	Date of Harvest							Total
	Feb. 20	Apr. 9	May 13	June 12	July 9	Aug. 7	Sept. 11	
	lbs dry matter/A							
Cibola ¹	2,289	4,522	2,026	2,894	2,331	1,337	1,295	16,694
P-5929 ²	2,211	4,379	1,912	2,907	2,138	1,440	1,600	16,587
Southern Special ³	1,946	4,199	2,191	3,139	2,125	1,362	1,539	16,501
CUF-101 ¹	2,324	4,730	2,011	2,712	2,262	1,250	1,161	16,449
WL-83T57-2 ³	2,189	4,621	1,891	2,986	2,323	1,183	1,199	16,393
Pierce ⁴	2,181	4,514	1,623	2,906	2,127	1,485	1,246	16,083
NAPB-29 ⁵	2,124	4,737	1,739	3,048	2,198	1,088	1,040	15,975
Valador ⁴	1,948	4,183	2,225	2,991	2,075	1,318	1,054	15,795
WL-83T51 ³	2,180	4,655	1,737	2,776	2,056	1,128	1,184	15,716
Granada ⁵	1,911	4,487	2,120	2,954	2,056	1,184	905	15,618
Baron ⁵	2,188	4,523	2,007	3,087	1,872	1,034	856	15,567
Florida-77 ²	2,430	4,719	1,617	3,001	1,604	722	815	14,908

¹University of California. ²Pioneer Hi-Bred. ³WL Company. ⁴Northrup King. ⁵North American Plant Breeders.

KEYWORDS: *Medicago sativa* L./yield/stand density/plant height/flowering/rust susceptibility/drought tolerance.

tremendous variability in the number of flowers per plot. Since rust was also observed in the plots, a numerical rating was assigned based on severity. Again, substantial variability between plots occurred, but no statistically significant differences in rust rating between cultivars were found.

Observations on the overall study area during the year revealed the importance of moisture availability on alfalfa production. As soil moisture was depleted, crop growth slowed to nothing, but was quick to respond when some rain was received. Also, a large oval patch encompassing several plots appeared to decline in the middle of the study. Investigations led to the conclusion that some soil property resulted in reduced available water for that particular area.

This study will be continued in order to determine how different rainfall levels and distributions will affect alfalfa production, to determine persistence of alfalfa after several years in this climate, and to determine whether differences between cultivars exist for these parameters.

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