# PUBLICATIONS
# 1988

# Forage Research In Texas, 1988

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

R. P. WIEDENFELD


## Summary

Second-year alfalfa yields at Weslaco averaged just under 11,000 lbs DM/A in 1987 with a range of a little over 30 percent difference between the highest and lowest yielding cultivars. Stresses including moisture availability and also possibly disease pressure appeared to be having increasing influence on the alfalfa as the stand aged. While the crop appeared to be severely injured under drought conditions, it recovered quickly and vigorously when rainfall was received.


## 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 higher pH's suitable for this crop (Evers and Dorsett 1986), but alfalfa's sensitivity to cotton root rot and other diseases, resulting from a humid environment, are thought to limit its potential in this area. Cultivars performance trials have reported good alfalfa yields in the coastal prairie (Evers 1985), clay pan area (Schubert and Pohler 1988; Holt and Simecek 1985), and East Texas Timberland (Smith and Gilbert 1985) resource areas of Texas. First-year alfalfa cultivars performance in the Lower Rio Grande Valley ranged from 14,900 to 16,700 lbs DM/A with no significant difference between 12 cultivars tested in a year with good, well-distributed rainfall (Wiedenfeld 1988). The question remains how long will these cultivars continue to thrive when stresses, including drought conditions and disease pressure, occur. This study was conducted to evaluate second-year alfalfa performance under the semi-arid subtropical conditions of the Lower Rio Grande Valley, and to compare yields for several commercial alfalfa 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 Argiustoll). Twelve alfalfa cultivars were planted in 10- to 20-ft plots in a randomized block design with three replications. Planting was done on 31 October 1985 on a rotovated seedbed 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. First-year alfalfa yields for this field study have been reported previously.

KEYWORDS: *Medicago sativa* L./yield/drought tolerance.

## Results

The alfalfa field study at Weslaco was harvested five times in its second year during 1987. Rainfall distribution in 1987 (Fig. 1) was not a great deal different from the distribution of the rainfall received in 1986 when seven cuttings were made; however, total rainfall was 23.8 inches in 1987 compared to 29.6 inches in 1986. Overall second-year alfalfa dry matter yields averaged just under 11,000 lbs/A which was over 30 percent less than the previous year. The range in total dry matter between the highest and lowest yielding cultivars in 1987 was 4,100 lbs/A which resulted in some statistically significant but minor differences between cultivars (Table 1). The second-year lower overall yields, as well as wider range among cultivars compared to the first year, indicated that stresses including moisture and also possibly disease pressure were affecting alfalfa production, probably more so on certain cultivars.

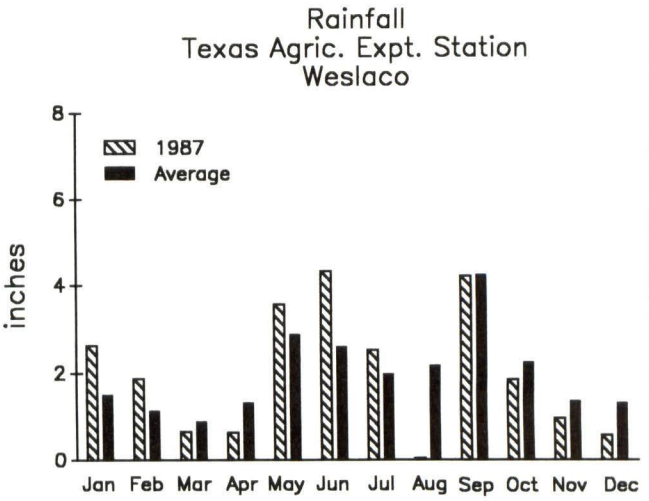


***Figure 1. Monthly rainfall total at Weslaco for 1987 and 72-year average.***

Observations on the overall study area during the year continued to indicate the importance of moisture availability on alfalfa production. During dry periods crop growth ceased and the plant stand appeared to be severely affected particularly in a central patch that covered several plots. However, when rainfall was received, plants recovered and grew vigorously and evenly throughout the area.

This study will be continued in order to evaluate age of stand and different climatic conditions on alfalfa production.

## Literature Cited


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TABLE 1. DRY MATTER YIELD OF ALFALFA CULTIVARS IN THEIR SECOND YEAR IN THE LOWER RIO GRANDE VALLEY OF TEXAS, 1987

| Cultivar | Date of Harvest | | | | | Total |
|---|---|---|---|---|---|---|
| | May 1 | June 3 | July 15 | Aug. 11 | Oct. 30 | |
| | Pounds/Acre | | | | | |
| Pierce[1] | 3,379 | 2,529a[6] | 2,531ab | 2,195a | 2,015a | 12,648a |
| CUF-101[2] | 3,285 | 2,302ab | 2,579ab | 1,933ab | 1,853ab | 11,952ab |
| Southern Special[3] | 3,037 | 2,558a | 2,607ab | 1,867ab | 1,734ab | 11,801ab |
| WL-83T57-2[3] | 3,207 | 2,259ab | 2,642ab | 1,568abc | 1,615ab | 11,291ab |
| WL-83T51[3] | 3,384 | 2,295ab | 2,352ab | 1,497abc | 1,759ab | 11,286ab |
| Valador[1] | 2,563 | 2,324ab | 2,780a | 1,610abc | 1,900ab | 11,177ab |
| Cibola[2] | 3,297 | 2,260ab | 2,157ab | 1,556abc | 1,662ab | 10,932ab |
| P-5929[4] | 3,172 | 2,263ab | 2,233ab | 1,616abc | 1,637ab | 10,922ab |
| Baron[5] | 2,915 | 2,165ab | 2,792a | 1,246 bc | 1,512ab | 10,630ab |
| Florida-77[4] | 2,820 | 2,152ab | 2,472ab | 1,073 bc | 1,503ab | 10,019ab |
| Granada[5] | 2,725 | 2,304ab | 2,101ab | 1,513abc | 1,201ab | 9,843ab |
| NAPB-29[5] | 2,873 | 1,757 b | 1,944 b | 832 c | 1,119 b | 8,525 b |

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


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