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# FORAGE VARIETY TRIAL FOR ALFALFA AT YOAKUM, 1994

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## Summary

Seven alfalfa (*Medicago sativa* L.) varieties including `Pioneer 5454', `Apollo', `Archer', `Florida 77', `Magnum III', `Multistar', and `Alfagraze', were evaluated as part of an establishment, yield potential and persistence study at the Yoakum experiment station in Lavaca County, Texas. Florida 77 produced the highest yield of 7092 lbs dry matter/acre from six harvests during 1994. Pioneer 5454 produced the lowest total yield of 3193 lbs dry matter/acre from the same number of harvests.

## Introduction

The availability of improved alfalfa varieties could result in a variety suitable for growth and production in the South Central Texas area. Lavaca, DeWitt, Gonzales, and surrounding counties are some of the highest cow-calf density areas in the nation. Any high quality forage which can be grown economically in this area has good potential for producers. Management of an adapted alfalfa variety can provide a high quality forage and result in soil improvement and erosion control without nitrogen fertilization. Alfalfa has not been successful in this area because of low soil fertility, insects, heat, limited moisture (35 in. annual rainfall), and higher management requirements than grasses. Because of the potential value alfalfa could have for the area, a variety trial was conducted at the Yoakum Station to document the yield range and identify management factors that could improve performance.

## Procedure

Seven alfalfa varieties were planted on a Hallettsville fine sandy loam soil with a pH of 6.3 on 19 November 1993. Inoculated seeds were planted into a prepared seedbed at the rate of 16.0 lbs/acre. Seed was drilled into 5-row plots, 20 feet in length with 8-inch row spacing. Experimental design was a randomized complete block with four replications. Herbicides were not necessary for weed control. The alfalfa plots were fertilized over the top with 188 lbs of $P_2O_5$/acre and 115 lbs of $K_2O$/acre on 2 March 1994. Fertilizer was applied according to soil test recommendations. Forage plots were harvested using 16- by 16-in. squares at two locations in

each plot. Samples were cut at a 2-in height initially at plant canopy closure and then at approximately 6- to 9- week intervals. After forage yield samples were taken, plots were uniformly cut using a forage harvester to remove the remainder of growth from the plot area. Yield samples were oven dried and dry matter per acre was calculated.

## Results

The lowest temperature recorded following planting was 24° F on 7 January and again on 1 February 1994. Eighteen days were recorded as having freezing temperatures. Freezing temperatures were recorded on three consecutive days, one week after planting, and again approximately one month after planting. Rainfall totals recorded by month are in Table 1. Some damage from freezing temperatures was noticed in plots, but it was not severe enough to effect seedling survival (data not shown). Alfalfa plots were harvested six times in 1994. Yields at the initial harvest were very low, which indicates the first harvest after establishment should have been delayed until the plants were better established (Table 2). April, May, and July yields ranged from 1000 to 1700 lbs dry matter/acre. Poor moisture conditions limited alfalfa growth after the July harvest. Cooler fall temperatures and good moisture conditions should have resulted in high yields at the November harvest. Only three varieties produced from 1000 to 1400 lbs dry matter/acre, which indicates plant nutrients may have limited growth. The alfalfa weevil and aphids, which can cause severe damage in spring, were not a problem in this study. When yields were totaled over the six harvest dates for 1994, Florida 77 had the highest total dry matter yield of 7092 lbs per acre. Pioneer 5454 produced the least forage yield at 3193 lbs per acre.

Limited rainfall in June and July reduced yield on all varieties, emphasizing the importance of plentiful water. The fact that no fertilizer was applied to the plots until March limited establishment and early production. With the application of fertilizer and ample rainfall, all alfalfa varieties in the test responded with dramatically increased yields. In relation to hay production, respective yields obtained from all varieties from six cuttings would not be profitable. Altering management practices such as delaying the initial harvest until 50% bloom and subsequent harvests at 10% bloom would have resulted in only about four harvests but with higher annual yields. Deficiencies in minor and micronutrients may also have limited alfalfa growth. Broadcast application and incorporation of limestone to correct soil acidity to neutral or higher levels (7.0-8.5) would have been beneficial.

Table 1. Monthly rainfall during the study period and long-term average, TAES-Yoakum.

| Month | 1993 | 1994 | 65-Year Mean |
|---|---|---|---|
| | | in | |
| Jan. | | 0.77 | 2.62 |
| Feb. | | 1.04 | 2.61 |
| Mar. | | 3.25 | 2.07 |
| Apr. | | 1.92 | 3.22 |
| May | | 6.49 | 4.54 |
| June | | 1.65 | 4.18 |
| July | | 0.26 | 2.69 |
| Aug. | | 5.13 | 2.99 |
| Sept. | | 4.74 | 3.94 |
| Oct. | | 18.33 | 3.46 |
| Nov. | 2.01 | 0.43 | 2.96 |
| Dec. | 2.35 | | 2.52 |

Table 2. Forage production of alfalfa varieties at Yoakum, 1994.

| Variety | Harvest dates | | | | | | Total yield |
|---|---|---|---|---|---|---|---|
| | 21 Feb | 4 Apr | 19 May | 11 Jul | 16 Sep | 22 Nov | |
| | lb dry matter/acre | | | | | | |
| Florida 77 | 501 | 1333 | 1661 | 1235 | 951 | 1410 | 7092 |
| Apollo | 332 | 1079 | 1718 | 1075 | 747 | 1003 | 5955 |
| Alfagraze | 405 | 1200 | 1546 | 998 | 898 | 872 | 5920 |
| Magnum III | 316 | 1227 | 1522 | 1122 | 867 | 860 | 5915 |
| Archer | 361 | 997 | 1736 | 1109 | 764 | 1159 | 4909 |
| Multistar | 359 | 1171 | 1764 | 1141 | 495 | 850 | 4752 |
| Pioneer 5454 | 224 | 1285 | 1644 | 1291 | 341 | 544 | 3193 |
| Mean | 357 | 1185 | 1656 | 1139 | 723 | 957 | 5391 |
| CV(%) | 47 | 16 | 22 | 26 | 41 | 29 | 36 |
| LSD (0.05) | 255 | 296 | 559 | 446 | 446 | 424 | 2896 |