

Alfalfa Variety Trial in Graham County, Arizona, 1996

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Abstract

Twenty four alfalfa varieties with Fall Dormancy ratings of 8 or 9 were tested in a replicated small plot trial on a heavy clay loam soil on the Safford Agricultural Center. This was the first year of a new study and there were some difficulties caused by irrigation management on the heavy soil. Pioneer 5888 was the highest yielding variety with a yield just over 9 tons per acre in 6 cuttings. Heat units with thresholds of 77° F and 40° F are included for each cutting in the study.

Introduction

This is the first year of a new study which includes the better varieties from the previous trial along with several new varieties that seem promising. This is the 21st year of continuous alfalfa variety testing in Graham county which was started by the third author. This was Mr. Cluff's last season as his life was terminated by cancer in October of 1996.

Materials and Methods

Twenty four alfalfa varieties with fall dormancy ratings ranging from 8 to 10 are included in this test. Plots were planted by hand using a Precision Garden Seeder Model 1001A from Earthway Products. Four rows on six inch spacings were planted 20 feet long with twelve inch spacings between varieties. Replicates were placed in a 2 by 2 arrangement to reduce errors due to soil variation.

Crop History:

Location: Safford Agricultural Center, Graham County
Elevation: 2950 feet above sea level
Soil type: Grabe clay loam
Planting date: 26 September, 1995 Rate: 25 lbs/acre
Herbicide: None
Fertilizer: 300 lbs/ac 16-20-0 at planting
Insecticide: Treatment to control alfalfa weevil
Irrigation: Border, 12 irrigations (ca. 80 acre inches)
Harvest strategy: Cut around 10% bloom to optimize quantity.
Plot size: 2.5 feet by 20 feet
Replicates: Four

Plots were cut by hand using a Troy mower and raked and weighed immediately to prevent loss of moisture. Weights were converted to dry weight at 0% moisture for reporting purposes.

Results and Discussion

Yield results from six of the seven cuttings are shown in Table 1. The first cutting average yield was nearly 0.6 tons per acre heavier than the first cutting on the previous trial (1). The weather in 1996 seemed perfect for a strong first cutting and record yields were reported by Greenlee County farmers. One must also consider the soil differences between the two experiments, the heavy soil at the current site may offer some benefits from increased water holding capacity but detriments from the problems of poor drainage. The question to be raised is whether varieties will respond differently to the soil conditions. This question will not be answered in this one year of experimentation. Perhaps at the end of this trial, at the end of four or five years, the answer will be known.

Pioneer 5888 was the leading variety with an annual yield above 9 tons per acre of dry matter. When converted to 12% moisture as we have reported in the past, this would correspond to 10.4 tons per acre of hay. An interesting observation is that the old variety, Cuf 101, yielded second in the trial. In the previous trial (2) Cuf 101 yielded just below Pioneer 5888 also, but they were in the lower half of the trial. Mesa, Mecca and Maricopa, varieties that had yielded so well in the past study are in the bottom quadrant in this study. Cutting number five was adversely affected by overwatering so it was sacrificed. This overwatering and scalding episode also affected the sixth and seventh cutting. Replanting was done in parts of the plots that were most affected to help the stand and integrity of the trial for the coming year. This study will be continued to see how the varieties perform in heavy soils.

References

1. Clark, L.J., E.W. Carpenter and R.E. Cluff. 1994. Alfalfa variety trial in southeastern Arizona, 1992-93. Forage and Grain, A College of Agriculture Report, The University of Arizona, Tucson, AZ. Series P-98, pp.13-16.
2. Clark, L.J., E.W. Carpenter and R.E. Cluff. 1996. Alfalfa variety trial in southeastern Arizona, 1995. Forage and Grain, A College of Agriculture Report, The University of Arizona, Tucson, AZ. Series P-106, pp.33-38.

Table 1. First year yield summary for 24 alfalfa varieties grown at 2950 feet above sea level in Southeastern Arizona. Yields are in tons per acre corrected to 0% moisture, ranks are in parentheses. (Graham county, Safford Agricultural Center. 32° 49' S. Latitude)

Variety	Cut 1 4/9	Cut 2 5/9	Cut 3 6/11	Cut 4 7/12	Cut 5 8/19	Cut 6 9/23	Cut 7 11/9	Total	% of Cuf 101
Pioneer 5888	2.84 (1)	1.87 (2)	1.64 (2)	1.48 (3)	—	0.87 (4)	0.49 (3)	9.19 a ¹	100.8
Cuf 101	2.56 (13)	1.92 (1)	1.72 (1)	1.44 (5)	—	0.98 (1)	0.51 (2)	9.12 a	100.0
SW 14	2.57 (12)	1.79 (4)	1.64 (3)	1.51 (1)	—	0.81 (8)	0.51 (1)	8.83 ab	96.8
WL91-224F	2.52 (14)	1.83 (3)	1.50 (11)	1.45 (4)	—	0.90 (3)	0.43 (10)	8.63 a-c	94.6
DK 189	2.68 (3)	1.78 (5)	1.51 (8)	1.35 (12)	—	0.86 (6)	0.44 (8)	8.62 a-c	94.5
UC 331	2.28 (22)	1.64 (10)	1.57 (4)	1.49 (2)	—	0.87 (5)	0.46 (5)	8.30 a-d	91.0
9390 APH	2.46 (16)	1.62 (12)	1.54 (6)	1.41 (7)	—	0.82 (7)	0.43 (9)	8.28 a-d	90.8
Prestige	2.64 (5)	1.65 (9)	1.47 (13)	1.33 (14)	—	0.73 (10)	0.45 (7)	8.26 a-d	90.6
9393 APH	2.60 (10)	1.60 (14)	1.38 (16)	1.26 (21)	—	0.92 (2)	0.49 (4)	8.24 a-d	90.4
WL 612	2.62 (7)	1.75 (6)	1.48 (12)	1.41 (8)	—	0.61 (16)	0.35 (19)	8.21 a-d	90.0
ABI 9194	2.61 (8)	1.58 (17)	1.54 (7)	1.25 (22)	—	0.77 (9)	0.45 (6)	8.20 a-d	89.9
UC Cibola	2.59 (11)	1.62 (13)	1.50 (10)	1.30 (16)	—	0.61 (17)	0.41 (11)	8.02 a-d	87.9
WL 88-137	2.65 (4)	1.55 (19)	1.45 (14)	1.42 (6)	—	0.60 (18)	0.32 (22)	7.98 a-d	87.5
SW 9301	2.70 (2)	1.54 (20)	1.51 (9)	1.27 (20)	—	0.58 (20)	0.39 (13)	7.97 a-d	87.4
SW 8210	2.63 (6)	1.62 (11)	1.31 (19)	1.37 (11)	—	0.61 (15)	0.41 (12)	7.95 a-d	87.2
WL 525 HQ	2.45 (17)	1.60 (16)	1.36 (17)	1.40 (10)	—	0.69 (11)	0.37 (16)	7.85 a-d	86.1
Pioneer 5715	2.53 (15)	1.68 (7)	1.38 (15)	1.21 (23)	—	0.64 (13)	0.35 (18)	7.77 a-d	85.2
Mecca II	2.60 (9)	1.67 (8)	1.29 (20)	1.41 (9)	—	0.44 (24)	0.29 (23)	7.68 a-d	84.2
UC 340	2.31 (20)	1.57 (18)	1.54 (5)	1.28 (18)	—	0.59 (19)	0.37 (15)	7.65 a-d	83.9
Mecca	2.26 (23)	1.60 (15)	1.34 (18)	1.33 (13)	—	0.68 (12)	0.33 (21)	7.54 b-d	82.7
Pioneer 5939	2.28 (21)	1.46 (24)	1.27 (22)	1.31 (15)	—	0.58 (21)	0.37 (17)	7.26 cd	79.6
Mesa	2.37 (18)	1.50 (22)	1.20 (24)	1.28 (17)	—	0.51 (22)	0.33 (20)	7.19 cd	78.8
Falcon	2.14 (24)	1.47 (23)	1.27 (21)	1.28 (19)	—	0.63 (14)	0.38 (14)	7.16 cd	78.5
Maricopa	2.32 (19)	1.53 (21)	1.25 (23)	1.11 (24)	—	0.49 (23)	0.28 (24)	6.98 d	76.5
Average	2.51	1.64	1.44	1.35	—	0.70	0.40	8.03	88.0
LSD(05)	0.41	0.28	0.29	0.27	—	0.38	0.13	1.27	
CV(%)	11.5	11.9	14.4	14.1	—	38.9	22.4	11.2	
Heat Units	1279	704	994	1038	1294	1095	—		

1. Values followed by the same letter are not significantly different at the 5% level of probability.