

# Alfalfa Variety Trial on Heavy Clay Soil in Graham County Arizona, 2000

*L.J. Clark and E.W. Carpenter*

## **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 fifth and final year of the study. Prestige was the highest yielding variety in 2000, but that still left it in sixth place behind Cuf 101 and WL 91-224F, which averaged 8.25 tons per acre over the five years of the study. Heat units with thresholds of 77° F and 41° F are included for each cutting in the study and percent of final stand count are recorded.*

## **Introduction**

This is the fifth year of a study which includes the best varieties from the previous trial along with several new varieties that seemed promising. Another study was started on lighter soil because the yield relations by variety were quite different on this heavy soil compared with previous studies in Safford. This other study will be reported on in another report in this document. This is the 25th year of continuous alfalfa variety testing in Graham county.

## **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: Guest clay

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, 14 irrigations (ca. 99 acre inches)

Harvest strategy: Cut around 10% bloom to optimize quantity and stand longevity.

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

This is the last year of this study, thus a percent of final stand is included in Table 2. Table 1 provides the yields per cutting in the current year and Table 2 gives a summary of the five years of the study. It should be noted that varietal responses differ with soil texture.

**Table 1. Fifth year yield summary for 24 alfalfa varieties grown at 2950 feet above sea level grown in heavy clay soil 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 4/20	Cut 2 5/31	Cut 3 6/26	Cut 4 7/26	Cut 5 9/5	Cut 6 10/3	Total 2000	% of Cuf 101
Prestige	1.95 a	1.64 a	1.14 a	1.38 ab	1.39 c	0.71 abc	8.21 a	105.3
UC 331	1.79 a	1.54 ab	1.02 a	1.26 abc	1.75 ab	0.66 a-d	8.11 ab	104.0
WL 91-224F	1.62 abc	1.54 ab	1.19 a	1.48 a	1.41 bc	0.75 ab	7.98 abc	102.3
DK 189	1.69 abc	1.44 ab	1.19 a	1.37 ab	1.72 abc	0.54 c-h	7.94 abc	101.8
WL 88-137	1.79 ab	1.45 ab	1.00 a	1.37 ab	1.69 abc	0.62 a-e	7.92 abc	101.5
Pio 5888	1.70 abc	1.41 ab	1.09 a	1.28 abc	1.73 abc	0.61 a-g	7.82 abc	100.3
<b>Cuf 101</b>	<b>1.64 abc</b>	<b>1.49 ab</b>	<b>0.98 a</b>	<b>1.33 abc</b>	<b>1.63 abc</b>	<b>0.74 ab</b>	<b>7.80 abc</b>	<b>100.0</b>
WL 525HQ	1.57 abc	1.58 ab	1.10 a	1.26 abc	1.48 abc	0.80 a	7.78 abc	99.7
ABI 9194	1.66 abc	1.28 ab	1.05 a	1.37 ab	1.61 abc	0.60 b-g	7.57 abc	97.1
9393 APH	1.59 abc	1.36 ab	1.02 a	1.22 abc	1.61 abc	0.67 a-d	7.47 abc	95.8
SW 9301	1.62 abc	1.42 ab	0.96 a	1.28 abc	1.60 abc	0.54 c-h	7.41 abc	95.0
SW 14	1.53 abc	1.42 ab	1.01 a	1.15 bc	1.82 a	0.42 gh	7.34 abc	94.1
WL 612	1.54 abc	1.19 b	1.11 a	1.35 ab	1.54 abc	0.62 a-f	7.33 abc	94.0
9390 APH	1.59 abc	1.28 ab	1.05 a	1.25 abc	1.61 abc	0.54 c-h	7.31 abc	93.7
Pio 5939	1.58 abc	1.39 ab	0.89 a	1.26 abc	1.69 abc	0.49 d-h	7.29 abc	93.5
Falcon	1.55 abc	1.45 ab	0.98 a	1.18 abc	1.61 abc	0.45 e-h	7.21 abc	92.4
SW 8210	1.43 bc	1.35 ab	0.97 a	1.05 c	1.77 a	0.46 e-h	7.01 abc	89.9
Mecca	1.44 bc	1.28 ab	.089 a	1.22 abc	1.61 abc	0.54 c-h	6.98 abc	89.5
UC Cibola	1.52 abc	1.24 ab	0.89 a	1.12 bc	1.65 abc	0.48 d-h	6.90 abc	88.5
Maricopa	4.48 abc	1.28 ab	0.84 a	1.19 abc	1.51 abc	0.51 d-h	6.81 abc	87.3
UC 340	1.29 bc	1.37 ab	0.90 a	1.18 bc	1.55 abc	0.49 d-h	6.78 abc	86.9
Mesa	1.31 bc	1.29 ab	0.84 a	1.12 bc	1.62 abc	0.42 gh	6.60 bc	84.6
Pio 5715	1.21 c	1.29 ab	0.83 a	1.13 bc	1.66 abc	0.42 fgh	6.55 c	84.0
Mecca II	1.29 bc	1.26 ab	0.89 a	1.10 bc	1.61 abc	0.35 h	6.50 c	83.3
Average	1.56	1.38	0.99	1.25	1.62	0.58	7.36	--
LSD(05)	0.41	0.35	0.30	0.24	0.28	0.16	1.24	--
CV(%)	18.7	18.0	21.2	13.8	12.3	20.7	12.0	--
HU(77/41EF)	1557	1135	857	1007	1345	853	6754	Avg=1125

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

**Table 2. Five year yield summary for 24 alfalfa varieties grown at 2950 feet above sea level grown in heavy clay soil in southeastern Arizona. Yields are in tons per acre corrected to 0% moisture, ranks are in parentheses.**

Variety	Source	Fall Dormancy Rating	1996 Yield Average	1997 Yield Average	1998 Yield Average	1999 Yield Average	2000 Yield Average	Five year Average	Percent Final Stand
<b>Cuf 101</b>	<b>Public</b>	<b>9</b>	<b>9.12 (2)</b>	<b>7.55 (4)</b>	<b>10.29(1)</b>	<b>7.84 (4)</b>	<b>7.80 (7)</b>	<b>8.25 a</b>	<b>46.9</b>
WL 91-224F	W-L Res		8.63 (4)	7.60 (2)	9.88(2)	8.35 (1)	7.98 (8)	8.25 a	49.4
UC 331	UC		8.30 (6)	7.68 (1)	9.46(9)	7.90 (2)	8.11 (2)	8.09 a	32.5
DK 189	DeKalb	8	8.62 (5)	7.40 (6)	9.70(5)	7.75 (5)	7.94 (4)	8.05 a	41.9
SW 14	S&W Seeds	9	8.83 (3)	7.60 (3)	9.32(11)	7.49 (7)	7.34 (12)	7.96 a	21.3
Prestige	Cargill	8	8.26 (8)	7.15 (11)	9.40(10)	7.71 (6)	8.20 (1)	7.92 ab	52.6
9390 APH	AgriPro		8.28 (7)	7.10 (12)	9.69(6)	7.87 (3)	7.30 (14)	7.81 ab	38.8
ABI 9194	AgriPro		8.20 (11)	7.30 (7)	9.06(15)	7.33 (11)	7.57 (9)	7.72 ab	51.4
WL 88-137	W-L Res		7.98 (13)	6.75 (16)	9.08(14)	7.26 (12)	7.92 (5)	7.56 ab	47.6
SW 9301	S&W Seeds	9	7.97 (14)	7.28 (8)	9.19(12)	7.10 (13)	7.41 (11)	7.55 ab	40.6
WL 525 HQ	W-L Res	8	7.85 (16)	6.68 (19)	9.65(7)	7.36 (10)	7.78 (8)	7.54 ab	76.9
Pioneer5888	Pioneer	8	9.19 (1)	7.25 (9)	9.08(13)	7.45 (8)	7.29 (15)	7.48 ab	31.3
9393 APH	AgriPro		8.24 (9)	6.80 (15)	8.52(18)	7.05 (14)	7.47 (10)	7.48 ab	53.1
Mecca	PGI/MBS	9	7.54 (20)	7.43 (5)	9.56(8)	7.36 (9)	6.98 (18)	7.45 ab	28.1
WL 612	W-L Res	9	8.21 (10)	6.38 (23)	9.85(3)	7.03 (15)	7.33 (13)	7.38 ab	46.3
SW 8210	S&W Seeds	8	7.95 (15)	7.15 (10)	7.51(24)	6.28 (22)	7.01 (17)	7.17 ab	26.3
Pioneer5939	Pioneer	9	7.26 (21)	6.73 (18)	8.95(16)	6.88 (17)	7.29 (15)	7.13 ab	26.9
UC Cibola	UC	9	8.02 (12)	6.53 (21)	8.21(21)	6.69 (19)	6.90 (19)	7.11 ab	36.3
Falcon	Lohse Mill	8	7.16 (23)	6.75 (17)	8.80(17)	6.97 (16)	7.21 (16)	7.09 ab	36.9
UC 340	UC		7.65 (19)	6.50 (22)	8.23(20)	6.74 (18)	6.78 (21)	7.00 ab	18.8
Maricopa	PGI/MBS	8	6.98 (24)	6.95 (13)	9.81(4)	6.40 (21)	6.81 (20)	6.96 ab	38.8
Pioneer5715	Pioneer	8	7.77 (17)	6.58 (20)	7.86(23)	6.61 (20)	6.55(23)	6.92 ab	24.4
Mecca II	PGI/MBS	9	7.68 (18)	6.80 (14)	8.01(22)	6.20 (23)	6.50(24)	6.87 ab	28.1
Mesa	PGI/MBS	8	7.19 (22)	5.85 (24)	8.29(19)	6.05 (24)	6.60(22)	6.54 b	41.9
Average			8.03	6.99	9.06	7.15	7.36	7.49	38.6
LSD(05)			1.27	1.14	1.47	1.44	1.24	1.16	18.2
CV(%)			11.2	11.5	13.45	12.3	12.0	11.0	33.4
Heat Units	(77/41EF)		7338	6502	7242	7473	6754	7061.8	

1. Values followed by the same letter are not significantly different at the 5% level of probability using Duncan's Multiple Range Test