

Alfalfa Varieties and Experimentals: Yield Evaluation Progress Report, Maricopa Agricultural Center, 1987

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This alfalfa variety and experimentals evaluation was seeded October 1, 1984 at the Maricopa Agricultural Center because no other alfalfa research was being conducted there. Thirty-one alfalfas from six breeding and seed companies, the University of Arizona and the University of California were seeded in five 7x7 Latin square designs. Latin square designs were conceived to increase the number of replications for greater experimental efficiency. Difficulty was anticipated in discerning varietal differences with small plots, light and salty soil and with an unknown variation in soil environment. Plot size was 5'x8' for harvest with a 5-foot sickle mower mounted on a small tractor.

The check variety "Lew" was common to the five Latin squares for comparing all entries across Latin squares. Lew was released by the University of Arizona Experiment Station in 1976 for its stem nematode resistance and vigorous winter growth. Although winter grazing with sheep, a common practice in the area, is conducive to spreading stem nematodes, no evidence of stem nematodes has shown in this test. A root-knot nematode resistant variety, "Cibola," was included in this test, in case root-knot nematodes were present. No problem has developed.

Green-weight yields have now been obtained from 21 harvests. Yield data for 13 harvests was presented in 1986 Forage and Grain Report, pages 34-37. Mean plot yields for the last eight cuttings, along with cumulative yields in pounds per plot and percent of Lew are presented in Tables 1-5, representing Latin squares 1-5. Data has been, in part analyzed statistically. Some significant differences have been obtained for certain harvests in some Latin squares. With harvest proceeding well into third year, these differences become more evident.

Real yield differences between varieties are not large. In Table 1, the decline in yields of "Ardiente", "Granada" and "Valiant" with cumulative yields of 88 to 91% of Lew, respectively, can be attributed to a decline in stand. "Salt Tolerant" and "Large Leaflet" experimentals with cumulative yields of 89 and 90% of Lew (Table 3) reflects their selection for specific physiological and morphological characteristics. They have non-dormant adapted backgrounds but were not specifically selected for yield. In Table 5, Lew and "Vallador" are non-dormant entries. The other five entries at 87 to 93% of Lew are semi-dormants and more specifically adapted to another area.

In this study, Lew has been a superior variety. Lew suffered from mildew and a blue aphid infestation in the spring of the year of establishment. It responded to more favorable conditions and overcome any lead other entries may have had. The data indicate that there are several varieties and experimentals very competitive with Lew. When utilized in areas more specific to their selection background of insect and disease resistance and growth environment, they have excellent potential.

Table 1. Yield comparisons for 8 harvests of 7 alfalfas in 1986-87 and data summary after 4 harvests, 13 harvests and 21 harvests.

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Variety	Source	1986-87 mean yields of green hay in lbs per plot ^{1/}							
		8-19	9-22	10-28	1-16	3-29	5-4	6-5	7-6
Lew(ck)	U of A	11.4a	9.2a	8.4a	9.8a	18.7a	16.3a	18.5a	14.6a
MS-LHT	U of A	11.7a	9.0a	8.5a	9.7a	17.5ab	15.6ab	18.1a	13.7ab
5929	Pioneer	9.4ab	5.7b	7.5abc	9.4a	17.2ab	15.7ab	18.1a	13.3abc
Cibola	U of C	8.9ab	7.4ab	6.9bcd	9.4a	17.8ab	15.0ab	17.1ab	13.5abc
Valiant	Valley	8.5b	7.2ab	6.6cd	8.0ab	16.8ab	14.6b	15.4b	13.1abc
Granada	NAPB	8.4b	6.9ab	6.7cd	8.1ab	16.7ab	14.3b	15.9b	11.9bc
Ardiente	Ferry-Morris	7.3b	6.2ab	5.9d	7.0b	16.6b	14.1b	15.2b	11.4c

Cumulative green hay yields

Variety	Source	After 4 harvests		After 13 harvests		After 21 harvests	
		lbs/plot	%/Lew	lbs/plot	%/Lew	lbs/plot	%/Lew
Lew(ck)	U of A	50.9	100	169.9	100	276.8	100
MS-LHT	U of A	53.7	106	167.7	99	271.5	98
5929	Pioneer	52.7	104	165.7	98	262.0	95
Cibola	U of C	53.9	106	164.9	97	260.9	94
Valiant	Valley	51.9	102	161.8	95	252.0	91
Granada	NAPB	53.7	106	159.0	94	247.9	90
Ardiente	Ferry-Morris	55.4	109	159.0	94	242.7	88

^{1/} Mean yields within cuttings followed by the same letter are not significantly different (P=0.05) by Tukey's Multiple Range Test.

Table 2. Yield comparisons for 8 harvests of 7 alfalfas in 1986-87 and data summary after 4 harvests, 13 harvests and 21 harvests.

		1986-87 Mean yields of green hay in lbs per plot ^{1/}							
Variety	Source	8-19	9-22	10-28	1-16	3-29	5-4	6-5	7-6
Lew	U of A	12.3a	9.5a	9.0a	9.5a	17.6a	15.5a	17.8a	14.4a
Pierce	NK	11.7ab	8.1b	7.6b	8.2bc	17.5a	14.5ab	16.1b	13.4a
Maxidor	NK	10.7bc	8.1b	7.8b	8.9ab	17.6a	14.7ab	15.9b	13.2a
83-587	NK	10.3c	8.0b	7.8b	9.1ab	17.5a	14.2ab	16.4b	13.4a
83-585	NK	11.7ab	8.1b	7.8b	7.8c	17.0a	14.7ab	16.6ab	13.5a
83-586	NK	10.8bc	7.9b	7.6b	8.5bc	17.1a	14.3ab	15.6b	12.9a
Cuf 101	U of C	10.5bc	7.6b	7.6b	8.6ab	16.8a	14.0b	15.4b	12.9a

		Cumulative green hay yields							
		lbs/plot	%/Lew	lbs/plot	%/Lew	lbs/plot	%/Lew	lbs/plot	%/Lew
Lew	U of A	59.3	100	171.8	100	277.4	100		
Pierce	NK	61.4	104	170.4	99	267.5	96		
Maxidor	NK	58.8	99	166.0	97	262.9	95		
83-587	NK	58.8	99	165.6	96	262.3	95		
83-585	NK	58.0	98	164.8	96	262.0	94		
83-586	NK	57.6	97	164.2	96	258.9	93		
Cuf 101	U of C	57.4	97	163.1	95	256.5	92		

^{1/} Mean yields within cuttings followed by the same letter are not significantly different (P=0.05) by Tukey's Multiple Range Test.

Table 3. Yield comparisons for 8 harvests of 7 alfalfas in 1986-87 and data summary after 4 harvest, 13 harvests and 21 harvests.

		1986-87 Mean yields of green hay in lbs per plot ^{1/}							
Variety	Source	8-19	9-22	10-28	1-16	3-29	5-4	6-5	7-6
BAR	U of A	12.2a	9.1a	9.2a	10.0a	18.6a	16.0a	17.6a	13.8a
Lew	U of A	12.3a	8.9ab	8.7ab	9.0b	17.6ab	15.4a	17.7a	14.5a
83-706	NK	12.3a	8.8ab	8.7ab	8.4b	16.4bc	14.5ab	16.5a	13.7ab
82-693	NK	12.0a	8.4b	7.9c	7.6c	16.1cd	15.2a	17.1a	13.7ab
83-705	NK	12.1a	8.5ab	8.0bc	7.8c	17.0bc	15.0a	17.0a	11.3b
82-692	NK	11.5a	7.7b	7.5c	7.8c	16.6bc	15.0a	16.5a	13.2ab
MEX-SON	U of A	11.9a	8.4b	7.9c	7.8c	14.8d	13.0b	14.9b	12.5ab

		Cumulative green hay yields							
		after 4 harvests		after 13 harvests		after 21 harvests			
		lbs/plot	%/Lew	lbs/plot	%/Lew	lbs/plot	%/Lew	lbs/plot	%/Lew
BAR	U of A	58.9	102	170.1	101	276.6	101		
Lew	U of A	58.0	100	168.7	100	272.8	100		
83-706	NK	61.2	106	172.0	102	270.9	99		
82-693	NK	57.9	100	167.7	99	265.7	97		
83-705	NK	58.1	100	167.6	99	264.3	97		
83-692	NK	58.5	100	162.2	96	258.0	95		
MEX-SON	U of A	57.2	99	160.6	95	251.8	92		

^{1/} Mean yields within cuttings followed by the same letter are not significantly different (P=0.05) by Tukey's Multiple Range Test.

Table 4. Yield comparisons for 8 harvests of 7 alfalfas in 1986-87 and data summary after 4 harvests, 13 harvests and 21 harvests.

Variety	Source	1986-87 Mean yields of green hay in lbs per plot ^{1/}							
		8-19	9-22	10-28	1-16	3-29	5-4	6-5	7-6
Lew	U of A	12.2a	9.1a	8.8a	9.0a	17.5a	15.8a	17.4a	13.8a
Mesa Sirsa	Pioneer	12.3a	8.9a	8.4ab	8.1b	16.4ab	15.9a	17.3ab	13.3a
P972	U of A	11.2ab	7.9c	8.0ab	8.2ab	17.5a	15.1ab	17.0ab	13.3a
83T57-2	WL	11.8ab	7.7c	7.7ab	7.9b	16.6ab	14.7abc	16.4ab	13.2a
83T51-2	WL	10.7b	7.9c	7.7bc	8.2ab	16.4ab	14.9abc	16.5ab	13.7a
Salt Tolerant	U of A	11.3ab	8.2bc	7.2c	7.9b	14.8c	13.8c	16.2ab	12.9a
Large Leaflet	U of A	11.2ab	8.6ab	8.3ab	7.7b	14.9c	14.3bc	15.9b	12.5a
Cumulative green hay yields									
Variety	Source	after 4 harvests		after 13 harvests		after 21 harvests			
		lbs/plot	%/Lew	lbs/plot	%/Lew	lbs/plot	%/Lew		
Lew	U of A	60.8	100	173.0	100	276.6	100		
Mesa Sirsa	Pioneer	61.0	100	169.1	98	269.7	98		
P572	U of A	63.7	105	171.2	99	269.4	97		
83T57-2	WL	63.9	105	168.5	97	264.5	96		
83T51-22	WL	64.4	106	167.6	97	263.6	95		
Salt Tolerant	U of A	56.6	93	157.7	91	250.0	90		
Large Leaflet	U of A	54.5	90	153.7	88	246.9	89		

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Variety	Source	1986-87 Mean yields of green hay in lbs per plot ^{1/}							
		8-19	9-22	10-28	1-16	3-29	5-4	6-5	7-6
Lew		11.7a	8.9a	9.2a	9.5a	18.4a	16.8a	18.8a	14.3a
Valador		11.0ab	8.0b	7.9b	8.1b	16.5ab	15.0b	16.9b	13.2abc
P581		11.6a	8.1b	7.9b	6.5c	17.3ab	15.6ab	16.8bc	13.5ab
P555		10.5bc	7.4bc	7.4bc	6.3c	16.6ab	15.4ab	16.9b	12.3bcd
83-580		9.8c	7.5b	7.3bc	6.3c	15.3b	14.3b	15.6bcd	11.1d
83-584		10.1bc	6.8c	6.9c	6.0c	15.3b	14.0b	15.4cd	11.7bcd
83-709		10.1bc	7.0c	6.8c	6.3c	15.1b	14.5b	15.2d	11.1cd

		Cumulative green hay yield means					
		after 4 harvests		after 13 harvests		after 21 harvests	
Variety	Source	lbs/plot	%/Lew	lbs/plot	%/Lew	lbs/plot	%/Lew
Lew	U of A	61.3	100	176.0	100	283.6	100
Valador	NK	59.6	97	167.5	95	264.1	93
P581	Pioneer	58.5	95	164.1	93	261.4	92
P555	Pioneer	58.6	96	162.9	93	255.7	90
83-580	NK	61.6	100	163.3	93	250.5	88
83-584	NK	61.7	101	161.5	92	247.7	87
83-709	NK	60.5	99	161.3	92	247.7	87

^{1/} Mean yield within cuttings followed by the same letter are not significantly different (P=0.05) by Tukey's Multiple Range Test.