DRY MATTER YIELDS OF TWENTY-TWO ALFALFA VARIETIES AT MADRAS, OREGON, 1982-1986

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ABSTRACT

The five-year yield trial of 22 alfalfa varieties at Madras was completed in 1986. In the fourth year of full production (1986) W-37, Apollo II, W-45, Trumpetor, Vernema, DeKalb 120, Valor, WL 220, Greenway 360, Pacer, WL 312, and Blazer were significantly more productive than Vernal. For total production over the five-year (1982-86) stand life, W-37 was superior to all other varieties, but it is not available for farm use and cannot be recommended because it is susceptible to bacterial wilt. Total yield for most varieties was similar.

Growers have many improved varieties from which to select for production in the Madras area. They should also use pest tolerance information to assure proper varietal selection for their field conditions.

Alfalfa variety trials have been conducted for many years in central Oregon. The Central Oregon Experiment Station's Madras site is one of two test locations. It has an elevation of 2,440 feet, a 115-120 day growing season, and mild winters. Seed companies submitted varieties for the trial which they thought had the most potential for the area but they were restricted to a maximum of three varieties that were commercially available. This report presents yield information for the entire test period (1982-86).

MATERIALS AND METHODS

Non-coated uninoculated seed of 22 alfalfa varieties was planted June 3, 1982, at 18 pounds/Acre. Each plot was five feet wide by 20 feet long. Varieties were replicated four times in a randomized complete block design. Before seeding, 110 pounds S and 90 pounds P/Acre were incorporated into the seedbed. In the spring of 1983, a top-dress application of

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the same fertilizer was also made. Eighty pounds S and 70 pounds P/Acre were top dressed in the spring of 1984. A single superphosphate-gypsum formulation [0-12-0-11(S)] at 625 and 500 pounds/Acre was top-dressed March 14, 1985, and March 24, 1986, respectively.

During establishment of the trial, broadleaf weeds were controlled with 2,4-DB at two pounds/Acre when the alfalfa had three to four trifoliate leaves. The only other herbicide application on the nursery was on March 14, 1985, with Sencor (50 percent active) and Paraquat (2 pounds + 1 pint/Acre).

The trial was sprinkler irrigated as needed during the five-year period. No insecticides or fungicides were applied to the nursery in any year.

Three cuttings were taken each year except the establishment year when two cuttings were taken. A forage harvester with a sickle cutter bar was used. The center (three feet wide by 14 feet long) of all plots was harvested when Vernal was in the first flower stage. However, in 1986, all plots were cut when the early maturing varieties, such as Trumpetor and Vernema, started to flower. A green alfalfa sample of about one pound was taken from each plot and oven-dried for use in dry matter determinations.

RESULTS AND DISCUSSION

In 1986, the 12 highest yielding varieties were superior to Vernal (Table 1). The five-year total yield of W-37 was superior to all other varieties but it is not available for commercial use. W-37 would not be recommended because it is susceptible to bacterial wilt. The total yield for most varieties was similar. Growers have a number of good varieties from which to select; their achievement of similar yield results will depend upon the closeness to which their field environment and management practices match those of the test location. No specific examination for any pest was made on any variety during the five-year test, although occasional wilted plants, light infestations of spring black stem, downy mildew, alfalfa weevil, aphids, and leaf hoppers were observed in some years. These pest problems are believed to have had negligible effect on variety performance. Nevertheless, growers should know their local alfalfa pest problems and field conditions to select varieties with the appropriate resistance level. Characteristics for the varieties evaluated have been tabulated (Table 2). Growers can find additional information from the references.

REFERENCES

1. Hannaway, David B. 1984. Selecting Alfalfa Varieties for the Pacific Northwest. A Pacific Northwest Extension Publication. PNW 244.

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Table 1. Annual and five-year total dry matter yields of 22 alfalfa varieties at Madras, Oregon, 1982-1986

Variety[1]	Seed or varietal source[2]	1982[3]	1983	1984	1985	1986	5-Year total		Vernal
		tons dry matter/a							%
W-37*	WA-USDA	2.66	9.06	8.31	7.89	7.10	35.08	a[4]	123
Trumpetor	NK	2.48	8.77	8.23	7.39	6.60	33.35	b	117
Apollo II	AgPr	2.61	8.45	7.76	7.62	6.81	33.07	bc	116
DeKalb 120	DK	2.72	8.31	8.25	7.25	6.49	33.00	bc	116
Vernema	WA-USDA	2.71	8.43	7.96	7.21	6.52	32.62	bcd	115
Pacer	US	2.24	8.82	8.25	7.11	6.05	32.35	b-e	114
WL 220	WL	2.59	8.32	7.93	7.02	6.35	32.33	b-e	114
DeKalb 130	DK	2.34	8.55	8.10	6.79	5.83	32.22	b-e	113
Blazer	US	2.64	8.55	7.76	6.67	5.91	32.13	b-e	113
Greenway 360	GS	2.65	8.38	8.00	6.53	6.21	32.11	b-e	113
Valor	US	2.27	8.45	7.79	7.05	6.43	32.10	b-e	113
Armor	AgPr	2.58	8.26	8.15	6.88	5.64	31.80	b-e	112
W-45*	WA-USDA	2.63	7.45	7.81	7.11	6.78	31.47	b-e	110
RS 209	DK	2.64	8.11	7.96	6.84	5.52	31.28	cde	110
WL 312	WL	2.57	8.12	7.40	6.76	6.01	31.08	cde	109
532	P	2.35	8.58	7.81	6.83	5.39	31.08	cde	109
WL 314	WL	2.53	8.10	7.59	6.38	5.82	30.64	def	108
Cascade	CE	2.59	7.83	7.66	6.39	5.60	30.54	ef	107
545	P	2.62	8.23	7.51	6.32	5.48	30.35	ef	107
Saranac	NY	2.22	7.99	7.20	6.10	5.55	29.07	fg	102
Vernal	WI-USDA	2.30	7.74	7.26	6.28	5.22	28.48	g	100
581	P	2.44	7.15	6.84	5.80	4.68	26.37	h	93
Average		2.51	8.25	7.80	6.83	6.00	31.48		
LSD 5%		NS	0.76	0.68	0.59	0.56	1.70		
CV (%)		12.00	6.47	6.21	6.06	6.55	3.81		

1* Experimental lines not available for commercial use.

2 Entering or originating agency: AgPr=AgriPro (formerly NAPB), CE=CENEX, DK=DeKalb-Pfizer Genetics, GS=Greenway Seeds, NK=Northrup King, NY=New York, P=Pioneer, US=Union Seed, WA=Washington, WI=Wisconsin, WL=W-L Research, USDA=United States Department of Agriculture.

3 Establishment year - total of two cuttings, total of three cuts for each of the other years.

4 Yield values followed by the same letter within a column are not significantly different at the 5 percent level using Duncan's multiple range test.

Table 2. Year of release, winter hardiness, disease, insect, and nematode resistance levels for alfalfa varieties entered in 1982-1986 Madras Trial. (Tabulated from reference number one.)

Variety[1]	Agency[2]	Year	WH[3]	Diseases[4]									Insects[5]				Nematodes[6]	
				BW	FW	VW	PRR	AN	SBS	CLS	LLS	DM	AW	PA	SAA	LH	RKN	SN
Apollo II	AgPr	1981	MH	R	R	MR	HR	LR	LR		MR	LR			MR			MR
Armor	AgPr	1981	MH	R	R		R	MR										
Blazer	US	1978	H	HR	R		MR	LR	MR	MR				R	S	MR	S	R
Cascade	CE		MH	R	MR	S	MR	R						MR	R			
DeKalb 120	DK	1978	H	HR	R		R	LR	MR	MR				R	S	LR		R
DeKalb 130	DK	1980	MH	HR	HR	LR	MR	MR	LR	LR	LR	LR		R	R			R
Greenway 360	GS																	
Pacer	US	1975	MH	R	MR		LR	S	MR	LR				R	S	MR		LR
RS 209	DK		H	R	R		R	MR						MR	MR			
Saranac	NY	1963	MH	R	R	S	S	S		LR		R						
Trumpetor	NK	1981	MH	MR	R	MR	S	MR		MR		MR	S	MR	S			MR
Valor	US	1974	H	R	MR		S	LR	MR	MR		R		R	S	MR	LR	LR
Vernal	WI-USDA	1953	H	R	R	S	S	LR	LR	LR	LR	LR					R	MR
Vernema	WA-USDA	1981	MH	MR		MR	LR	S										R
W-37*	WA-USDA		MH	S		R												
W-45*	WA-USDA		MH			LR												
WL 220	WL	1977	H	R	HR	LR	MR	LR		LR	LR	LR		HR	MR			LR
WL 312	WL	1978	MH	R	HR	LR	MR	LR	LR	MR	MR	LR		R	R			MR
WL 314	WL	1981	MH	R	R	LR	LR	MR		LR		LR		HR	R			HR
532	P	1979	H	HR	R		LR	LR										
545	P	1977	H	R	MR		R	LR		R		R		S	R			MR
581	P	1977	MH	R			R			LR		R		LR	R			

1* Indicates experimental lines not available for commercial use.

2 Entering or originating agency: AgPr=AgriPro (formerly NAPB), CE=CENEX, DK=DeKalb-Pfizer Genetics, GS=Greenway Seeds, NK=Northrup King, NY=New York, P=Pioneer, US=Union Seed, WA=Washington, WI=Wisconsin, WL=W-L Research, USDA=United States Department of Agriculture.

3 WH=Winter hardiness; MH=moderately winter hardy or semi-dormant; H=winter hardy or dormant

4 Diseases: BW=bacterial wilt; FW=Fusarium wilt; VW=Verticillium wilt; PRR=Phytophthera root rot; AN=Anthracnose; SBS=Spring black stem; CLS=common leaf spot; LLS=Lepto leaf spot; DM=downy mildew.

5 Insects: AW=alfalfa weevil; PA=pea aphid; SAA=spotted alfalfa aphid; LH=leaf hopper.

6 Nematodes: RKN=root knot nematode; SN=stem nematode.

Resistance levels: S=susceptible (5% or fewer resistant plants);
LR=low resistance (6-14% resistant plants);
MR=moderate resistance (15-30% resistant plants);
R=resistant (31-50% resistant plants);
HR=highly resistant (more than 50% resistant plants).