

1995 RESULTS FROM A FORAGE ALFALFA VARIETY EVALUATION TRIAL ESTABLISHED IN THE FALL OF 1992

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Purpose

The purpose of this trial, which includes 7 public and 28 proprietary alfalfa cultivars, is to identify high-yielding alfalfa forage cultivars with good stand persistence in the Treasure Valley. It is expected that this trial will be maintained through 5 harvest seasons until the fall of 1997.

Procedure

In mid-September 1992, following a crop of winter wheat, the trial area was cross-disked and cross-rippled. Because soil test results showed very low phosphorus levels, 970 pounds of P_2O_5 per acre and 205 pounds of N per acre as 11-52-0 were applied prior to final seed bed preparation. The fertilizer was incorporated into the soil profile during ensuing secondary tillage operations which included disking, rototilling, and land-planing. A preplant application of benefin (Balan DF) at 1.5 lb ai/ac in 20 gallons of water per acre was applied by ground rig and rototilled into the top 4 inches of the soil profile. The field was bedded on 60-inch centers, and the beds were firmed with a rubber-tire roller. Individual plots measuring 5 feet wide by 22 feet long and separated at each end by 3-foot-wide bare soil alleys were arranged in a randomized complete-block design with four replications and seeded on September 16. Seed was drilled approximately ¼-inch to ½-inch deep into dry soil with a seven-row disk-opener plot drill. The seeding rate was 20 pounds per acre. To promote rapid germination and assure stand establishment, three 4-hour long sprinkler irrigations were applied over the trial area between September 17th and 20th. No cuttings were taken during the establishment year.

For each crop year, yield data for each cutting is collected by harvesting a 3-foot by 22-foot-long strip through the center of each plot with a flail forage harvester and weighing the freshly cut green forage. Forage moisture content is determined by drying samples from eight randomly selected plots. Plot yields are converted to 88 percent dry matter, which is typical of hay produced in the area. Additionally, in each crop year Near Infrared Reflectance Spectroscopy (NIRS) analysis is utilized to evaluate forage quality (crude protein and acid detergent fiber) of each entry within one replication for the second and third cuttings. Tissue samples for the NIRS analyses, taken immediately prior to the second and third cuttings, are collected by randomly selecting 20 mature stems from each plot within the first replication.

Procedures pertaining to the annual maintenance and management of this trial during the 1993 and 1994 crop years are discussed in previous MES annual reports. All plots were harvested four times in 1993 and five times in 1994. In both years forage quality measurements were taken from the second and third cuttings.

On January 24, 1995, in preparation for the up-coming harvest season, a dormant application of metribuzin (Sencor 75 DF) at 0.93 lb ai/ac in 30 gallons of water per acre was broadcast applied over the trial area.

Four cuttings were taken during the 1995 harvest season. NIRS analysis was utilized to evaluate forage quality for the second and third cuttings.

Results and Discussion

The mean 1995 total-season yield at 88 percent DM was 8.5 tons per acre (Table 1). Third-year total-season yields ranged from 9.0 tons for Lobo, AP 8950, and ABI 9151 to 7.9 tons per acre for Maxi-Leaf. The total-season yields for Lobo, AP 8950, and ABI 9151 were significantly greater than the total-season yield for 1-T-11.

Forage quality values (ADF and CP) for 1995, derived from samples taken from one replication for the second and third cuttings, are presented in Table 2. The mean ADF over both cuttings was 35.2 percent. Differences in mean ADF values over the two cuttings among cultivars were not significant. The mean CP over both cuttings was 19.1 percent. Differences in mean CP values over the two cuttings among cultivars were not significant.

The mean three year-yield at 88 percent DM for the trial was 31.2 tons per acre (Table 3). Three year-total yields ranged from 33.4 tons for Lobo to 28.5 tons for PSS 393. The total yield for Lobo was significantly greater than the total yield for WL 320.

The three-year mean forage quality values (ADF and CP) of each cultivar for the second and third cuttings are presented in Table 4.

Information obtained from the participating seed companies and/or literature produced by the Certified Alfalfa Seed Council pertaining to winter hardiness and insect and disease resistance is presented in Table 5.

Table 1. Third-year forage yield of 35 alfalfa cultivars at Malheur Experiment Station, Oregon State University, Ontario, Oregon, 1995.

Cultivar	Yield by cutting and cutting date				Total
	1st 5/17	2nd 6/23	3rd 7/27	4th 8/31	
Lobo	2.6	2.3	2.2	1.9	9.0
AP 8950	2.7	2.3	2.1	1.9	9.0
ABI 9151	2.5	2.4	2.2	1.9	9.0
Achieva	2.7	2.3	2.0	1.8	8.9
WL 320	2.7	2.3	2.0	1.9	8.9
Archer	2.5	2.4	2.2	1.9	8.9
Asset	2.7	2.2	2.0	1.8	8.8
PGI 2152	2.7	2.2	2.0	1.9	8.8
Garst 630	2.6	2.2	2.0	1.8	8.7
3 J 15	2.7	2.2	2.1	1.7	8.7
Excalibur II	2.5	2.3	2.1	1.8	8.7
WL 323	2.6	2.2	2.1	1.7	8.7
Vernema	2.7	2.3	1.9	1.7	8.6
Hyland	2.5	2.3	2.0	1.8	8.6
Sutter	2.4	2.3	2.0	1.8	8.6
5683	2.4	2.2	2.1	1.9	8.6
Perry	2.6	2.2	2.0	1.7	8.5
Wrangler	2.6	2.2	2.0	1.7	8.5
1-A	2.5	2.2	2.1	1.8	8.5
5472	2.4	2.2	2.1	1.8	8.5
Ovation	2.7	2.1	2.0	1.8	8.5
PSS 393	2.5	2.2	1.8	1.8	8.4
Washoe	2.4	2.3	2.0	1.7	8.4
Lahontan	2.5	2.1	2.1	1.8	8.4
DK133	2.5	2.2	2.0	1.7	8.4
ABI 9160	2.3	2.2	2.0	1.9	8.4
Blazer-XL	2.5	2.1	1.9	1.8	8.3
Crystal	2.4	2.2	2.0	1.8	8.3
WL 322 HQ	2.3	2.2	2.0	1.8	8.3
1-T-11	2.4	2.1	2.0	1.7	8.2
Future	2.5	2.1	1.9	1.7	8.2
CUF-101	2.2	2.4	2.0	1.6	8.1
WL 317	2.4	2.0	1.9	1.7	8.1
5364	2.4	2.0	1.9	1.7	8.0
Maxi-Leaf	2.3	2.0	1.9	1.6	7.9
Mean	2.5	2.2	2.0	1.8	8.5
LSD(0.05)	0.4	0.2	0.2	0.2	0.7
C.V. (%)	10.0	7.7	5.3	5.9	5.4

Yields are reported at 88 percent dry matter.

Table 2. Percent acid detergent fiber (ADF) and percent crude protein (CP) by cutting from one replication of second and third cuttings of 35 alfalfa cultivars at Malheur Experiment Station, Oregon State University, Ontario, Oregon, 1995.

Cultivar	Cutting and cutting date					
	2nd (6/23)		3rd (7/27)		Mean	
	ADF	CP	ADF	CP	ADF	CP
			%			
Lobo	34.4	18.2	38.6	17.4	36.5	17.8
AP 8950	35.1	17.3	37.1	19.0	36.1	18.1
ABI 9151	34.4	17.6	34.3	20.2	34.3	18.9
Achieva	34.9	19.8	37.4	18.9	36.1	19.3
WL 320	33.5	19.6	32.1	22.0	32.8	20.8
Archer	34.9	18.7	38.8	17.7	36.9	18.2
Asset	35.1	18.0	36.3	19.9	35.7	18.9
PGI 2152	31.5	20.1	36.0	18.6	33.7	19.4
Garst 630	36.5	17.9	34.1	21.2	35.3	19.5
3 J 15	32.1	20.4	35.6	19.4	33.8	19.9
Excalibur II	34.4	19.7	38.0	18.3	36.2	19.0
WL 323	29.4	22.2	37.7	18.3	33.6	20.3
Vernema	30.7	20.9	40.2	17.2	35.4	19.0
Hyland	38.1	16.4	37.5	18.3	37.8	17.4
Sutter	33.7	18.6	37.4	18.2	35.6	18.4
5683	34.5	19.0	35.4	19.8	34.9	19.4
Perry	33.1	20.7	35.3	20.3	34.2	20.5
Wrangler	32.5	21.4	34.7	20.6	33.6	21.0
1-A	35.2	18.4	38.0	18.1	36.6	18.2
5472	34.0	18.9	34.9	20.5	34.5	19.7
Ovation	36.1	18.5	34.5	20.1	35.3	19.3
PSS 393	33.3	19.9	41.7	15.7	37.5	17.8
Washoe	34.2	18.4	37.6	18.3	35.9	18.3
Lahontan	36.6	18.2	38.2	17.9	37.4	18.0
DK133	31.9	21.9	35.0	19.9	33.4	20.9
ABI 9160	34.4	18.9	37.3	18.3	35.9	18.6
Blazer-XL	39.3	16.2	36.5	18.9	37.9	17.6
Crystal	36.3	17.8	33.1	21.2	34.7	19.5
WL 322 HQ	32.9	19.7	31.9	22.0	32.4	20.8
1-T-11	36.7	17.3	34.4	21.1	35.6	19.2
Future	36.9	17.1	32.4	21.8	34.6	19.5
CUF-101	33.5	18.6	36.7	18.3	35.1	18.5
WL 317	36.0	17.5	32.2	21.7	34.1	19.6
5364	34.3	18.5	34.8	20.3	34.5	19.4
Maxi-Leaf	34.5	19.0	35.4	19.1	35.0	19.1
Mean	34.4	18.9	36.0	19.4	35.2	19.1
LSD(0.05)					NS	NS
C.V. (%)					7.3	8.4

Table 3. Seasonal and 3-year forage yield totals of 35 alfalfa cultivars at Malheur Experiment Station, Oregon State University, Ontario, Oregon, 1995.

Cultivar	Seasonal yield by year			Three year total
	1st 1993	2nd 1994	3rd 1995	
Lobo	13.5	10.9	9.0	33.4
Archer	12.9	10.9	8.9	32.8
Achieva	12.7	11.1	8.9	32.6
AP 8950	12.7	10.8	9.0	32.5
PGI 2152	13.1	10.6	8.8	32.4
DK133	13.2	10.8	8.4	32.4
5683	12.7	10.8	8.6	32.0
Garst 630	12.7	10.5	8.7	31.9
Excalibur II	12.6	10.6	8.7	31.9
Blazer-XL	12.9	10.6	8.3	31.9
ABI 9151	12.4	10.4	9.0	31.8
1-A	12.7	10.6	8.5	31.8
Asset	12.5	10.2	8.8	31.6
WL 323	12.2	10.7	8.7	31.6
Sutter	12.4	10.6	8.6	31.6
WL 320	12.2	10.4	8.9	31.5
5472	12.2	10.7	8.5	31.5
ABI 9160	12.3	10.7	8.4	31.4
Hyland	12.3	10.5	8.6	31.3
3 J 15	12.1	10.3	8.7	31.1
Lahontan	12.5	10.1	8.4	31.1
Crystal	12.5	10.3	8.3	31.1
Wrangler	12.4	10.1	8.5	31.0
Ovation	11.9	10.4	8.5	30.7
WL 317	12.3	10.3	8.1	30.7
WL 322 HQ	11.9	10.4	8.3	30.5
1-T-11	12.2	10.2	8.2	30.5
Future	11.8	10.3	8.2	30.4
Washoe	11.8	10.0	8.4	30.3
Vemema	11.7	9.9	8.6	30.2
Maxi-Leaf	12.2	9.8	7.9	29.9
Perry	11.7	9.6	8.5	29.8
CUF-101	12.0	9.4	8.1	29.6
5364	11.8	9.8	8.0	29.5
PSS 393	11.6	8.5	8.4	28.5
Mean	12.4	10.3	8.5	31.2
LSD(0.05)	1.2	0.7	0.7	1.8
C.V. (%)	7.0	4.9	5.4	4.1

Yields are reported at 88 percent dry matter.

Table 4. Mean percent acid detergent fiber (ADF) and percent crude protein (CP), by cutting, from one replication of second and third cuttings of 35 alfalfa cultivars over three years at Malheur Experiment Station, Oregon State University, Ontario, Oregon, 1995.

Cultivar	Cutting					
	2nd		3rd		Combined	
	ADF	CP	ADF	CP	ADF	CP
	%					
Perry	31.1	21.9	30.9	20.7	31.0	21.3
Wrangler	31.1	22.0	30.5	21.5	30.8	21.8
Vernema	31.8	21.1	33.6	19.1	32.7	20.1
PSS 393	32.9	20.4	34.1	18.8	33.5	19.6
Washoe	31.9	21.0	36.0	18.0	34.0	19.5
Lahontan	33.6	20.7	35.9	18.2	34.7	19.4
CUF-101	33.0	19.5	34.8	18.5	33.9	19.0
1-A	33.4	20.0	33.5	19.5	33.5	19.8
1-T-11	32.5	20.8	31.9	20.8	32.2	20.8
Asset	33.1	20.1	32.8	20.6	32.9	20.3
Achieva	32.7	21.1	33.4	20.1	33.1	20.6
Hyland	34.4	19.4	34.1	19.3	34.3	19.4
Garst 630	33.3	20.6	31.7	20.9	32.5	20.7
Maxi-Leaf	32.0	21.1	31.5	20.7	31.7	20.9
Future	33.4	20.3	31.2	21.4	32.3	20.8
DK133	32.1	21.9	31.9	20.9	32.0	21.4
Blazer-XL	35.7	18.9	33.1	19.6	34.4	19.3
3 J 15	31.2	21.6	31.9	20.8	31.6	21.2
4 J 19	31.4	21.7	32.9	20.2	32.2	21.0
Lobo	31.9	20.9	33.8	19.3	32.9	20.1
Crystal	33.8	19.9	31.4	20.8	32.6	20.4
Sutter	32.3	20.3	34.6	18.4	33.4	19.3
PGI 2152	32.0	20.7	33.2	19.7	32.6	20.2
5472	32.8	20.4	33.8	19.4	33.3	19.9
5364	32.8	20.5	32.9	19.8	32.8	20.2
5683	32.2	20.8	32.8	19.6	32.5	20.2
WL 317	31.9	21.0	31.3	21.0	31.6	21.0
WL 320	30.8	22.1	31.7	21.4	31.2	21.8
WL 322 HQ	30.7	22.4	31.2	21.4	30.9	21.9
89-30	32.5	21.2	31.7	20.7	32.1	21.0
WL 323	30.6	22.1	33.8	19.8	32.2	20.9
AP 8950	31.2	21.4	33.3	19.9	32.3	20.7
ABI 9160	31.9	21.4	33.1	19.7	32.5	20.5
ABI 9151	32.3	20.1	33.3	19.6	32.8	19.8
Archer	32.1	21.2	34.9	19.1	33.5	20.2
Mean	32.3	20.9	32.9	20.0	32.6	20.4

Table 5. Disease and insect resistance levels for the 35 alfalfa cultivars included in the 1992-1997 alfalfa forage evaluation trial at Malheur Experiment Station, Oregon State University, Ontario, Oregon, 1995. Data presented in this table was derived from information provided by participating seed companies and/or the Certified Alfalfa Seed Council.

Cultivar	Source	Year of release	FD	Pathogen or insect									
				BW	VW	FW	AN	PRR	SAA	PA	SN	APH	RKN
Perry	USDA/U.Neb	1979	3	R	S	R	LR	MR	MR	R	-	-	-
Wrangler	USDA/U.Neb	1983	2	R	LR	R	LR	HR	HR	HR	-	-	-
Vernema	USDA/WSU	1981	4	MR	MR	-	LR	LR	MR	-	HR	-	-
PSS 393	Price & Sons	(nr)	6.5	-	-	-	-	-	-	-	-	-	-
Washoe	USDA/UNV	1965	5	R	-	-	LR	R	R	R	R	-	-
Lahontan	USDA/UNV	1954	6	MR	S	LR	-	LR	MR	LR	R	-	S
CUF-101	USDA/UC	1976	9	-	-	HR	-	MR	HR	HR	LR	-	MR
1-A	Candy Co.	1992	3	-	-	-	-	-	-	-	-	-	-
1-T-11	Candy Co.	1992	5	-	-	-	-	-	-	-	-	-	-
Asset	Allied Seed	1990	4	HR	R	R	R	HR	R	R	-	MR	-
Hyland	Oasis Seed	1993	3	HR	R	HR	R	HR	R	HR	R	MR	-
Garst 630	ICI Americas	1985	4	HR	MR	R	MR	R	MR	R	R	-	-
MaxiLeaf	Ray Brothers	1993	4	R	LR	MR	R	R	-	-	-	-	-
Future	Ray Brothers	1987	3	HR	MR	MR	LR	R	MR	-	MR	-	-
DK 133	Delkalb Plant Genetics	1991	4	HR	R	HR	HR	HR	R	R	MR	R	-
Blazer-XL	Union Seed	1991	3	R	R	HR	HR	HR	HR	R	R	R	-
3 J 15	Union Seed	(nr)	3	HR	R	HR	HR	HR	HR	R	R	-	-
Excalibur II	Allied Seed	1993	4	HR	R	HR	HR	HR	HR	R	R	R	-
Lobo	SeedTec	1991	6	MR	MR	HR	HR	R	HR	R	R	-	R
Crystal	PGI/MBS	1990	4	HR	R	HR	R	HR	LR	R	MR	MR	-
Sutter	PGI/MBS	1987	7	R	LR	HR	LR	HR	HR	R	R	-	-
PGI 2152	PGI/MBS	1992	5	HR	R	HR	R	R	HR	R	MR	-	-
5472	Pioneer Hi-Bred	1989	4	HR	MR	HR	MR	MR	R	HR	R	-	-
5364	Pioneer Hi-Bred	1989	4	R	MR	R	MR	MR	HR	HR	R	-	-
5683	Pioneer Hi-Bred	1988	7	MR	S	R	S	R	HR	R	R	-	-
WL 317	W-L Research	1988	3	HR	R	HR	R	HR	HR	HR	R	-	MR
WL 320	W-L Research	1985	4	R	MR	HR	MR	R	R	R	MR	-	-
WL 322 HQ	W-L Research	1991	4	HR	R	HR	MR	R	HR	HR	LR	-	LR
Ovation	W-L Research	(nr)	4	HR	HR	HR	HR	HR	MR	R	MR	R	-
WL 323	W-L Research	1993	4	HR	R	HR	HR	HR	MR	R	R	R	-
AP 8950	ABI	(nr)	4	MR	MR	HR	MR	R	HR	HR	R	-	R
ABI 9160	ABI	(nr)	5	MR	MR	MR	-	R	R	R	R	-	R
ABI 9151	ABI	(nr)	5	MR	MR	HR	MR	R	-	-	MR	-	-
Archer	America's Alfalfa	1988	5	MR	LR	HR	MR	R	-	-	MR	-	-

Information confirmed by the National Alfalfa Variety Review Board.

(nr) Not released or no release date available.

FD = Fall Dormancy, BW = Bacterial Wilt, VW = Verticillium Wilt, FW = Fusarium Wilt, AN = Anthracnose, PRR = Phytophthora Root Rot, SAA = Spotted Alfalfa Aphid, PA = Pea Aphid, SN = Stem Nematode, APH = Aphanomyces, RKN = Root Knot Nematode.

Fall Dormancy: 1 = Norseman, 2 = Vernal, 3 = Ranger, 4 = Saranac, 5 = DuPuits, 6 = Lahontan, 7 = Mesilla, 8 = Moapa 69, 9 = CUF 101.

Disease and Insect Resistance: >50% = HR (Highly Resistant), 31-50% = R (Resistant), 15-30% = MR (Moderately Resistant), 6-14% = LR (Low Resistance), 0-5% = S (Susceptible).