Fall Dormancy Effect on Four-cut Alfalfa Production

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Abstract

Alfalfa is an important crop for central Oregon. Six varieties, representing fall dormancies (FD)1-6, were planted in August of 1998 at the Central Oregon Agricultural Research Center, Madras, Oregon. The trial was conducted as a four-cut harvest management trial and run for 4 years. Variety FD 4 produced the highest total 5-year yield at 44.97 tons/acre, which was significantly higher than FD 2, 3, 5, and 6 yields; these were significantly higher yielding than FD 1 at 39.88 tons/acre. There was 4.09 tons per acre yield difference. The varieties (FD) ranked 5, 6, 4, 3, 2, 1 for 5-year average yields on fourth cutting.

Introduction

Alfalfa continues to be an important crop for central and eastern Oregon. Over the years, there has been a range of perhaps 35,000 to 50,000 acres of alfalfa grown in the three counties. The alfalfa is grown in pure stands and grass/alfalfa mixtures for hay. Locally the hay produced is marketed to livestock producers, dairies and feed stores in Oregon, Washington, and California. Some alfalfa is exported to Pacific Rim countries. Alfalfa is an important rotational crop to help break disease and insect cycles, and adds nitrogen (N) to the soil for subsequent crops through nitrogen fixation.

Seed companies continue to develop and market numerous varieties. In past years, varieties with an FD rating of 1-3, and some with 4 have typically been planted, but recently, some producers in central Oregon have begun planting more FD-4 varieties, with an occasional FD-5 variety planted.

"The expression of fall dormancy depends on the combination of shortening day length and cool temperatures. Under short day conditions, differences among dormant and nondormant cultivars are more pronounced at low temperatures. At cool temperatures, dormant cultivars have the greatest dormancy response and nondormant cultivars have the least response. Maximum dormancy seems to be induced at a temperature of 15.5°C and a photoperiod of 12 hours. Accordingly a decrease in photoperiod and temperature causes a greater decrease in top growth of fall dormant cultivars than in the non fall dormant cultivars. Under long day conditions there is little difference in regrowth between dormant and nondormant cultivars."

"In general, American alfalfa cultivars trace to nine different distinct sources of germplasm from different regions of the world. These germplasm sources are *Medicago falcate*, Ladak; *M. varia*, Turkistan, and Flemish, Chilean, Peruvian, Indian, and African varieties listed in their approximate descending order of winter hardiness and fall dormancy characteristics. A tenth source of very nondormant germplasm from Saudi Arabia has generally gone unrecognized."

"Fall dormancy is classified on the basis of vegetative growth observed in the autumn, particularily in northern latitudes. Dormants are northern types and nonodormants are southern types." (Mckenzie, et al.).

Selecting an alfalfa variety is important. Fall dormancy and winter hardiness genes in alfalfa have been delinked in recent years. There has been more interest in planting alfalfa varieties with higher fall dormancy ratings because of the potential of higher yield on last cutting.

The information generated by this trial is limited because only one entry represents each fall dormancy rating. It will begin to build an information base that is important to producers, fieldmen, seed suppliers, and the seed companies who are involved in central Oregon alfalfa forage production.

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Materials and Methods

'Trical 102' triticale was planted in the field in the fall of 1997 and was then plowed down as a green manure crop. Soil samples were taken in August, 1998 and analyzed by Agri-check, Inc., Umatilla, Oregon (Table 1). Fertilizer was applied prior to planting and disked into the top 6 inches of soil (Table 2). The field was then leveled and rolled prior to planting. Based on soil test results, phosphorus, sulfur, boron and potassium were applied and worked into the soil prior to planting on August 21, 1998

Table 1. Soil test analyses from alfalfa variety trial soil samples taken at the **Central Oregon Agricultural Research Center**, Madras, Oregon.

Date	Depth (in)	pH	P (ppm)	K (ppm)	Ca (meq /100g)	Mg (meq /100g)	B (ppm)	Zn (ppm)	Sol Salts Mmhos /cm	Se (ppm)	NA Meq/100 g
1998	0-10	6.7	25	539	10.3	5.4	0.4	0.5			0.37
2000											
2002		6.7	29	215	--	--					
3/2003	0-12	7.4	29	386	10.9	4.7	0.6	0.52	0.7	<0.10*	

* below the minimum detectable level.

Table 2. Nutrient applications made to the alfalfa variety trial at the **Central Oregon Agricultural Research Center**, Madras, Oregon.

Date applied	N (lb/acre)	P_2O_5 (lb/acre)	K_2O (lb/acre)	Ca (lb/acre)	S (lb/acre)	B (lb/acre)	Zn (lb/acre)
8/21/1998	33	259			72	2.6	
3/24/2000		94			47		
3/22 /2001		90	180	210	40	2.0	10
3/21/2002		90	180	210	40		
3/12/2003				252	48		

Six alfalfa varieties, representing FD 1-6 were planted at the Central Oregon Agricultural Research Center (COARC) Madras, on August 25, 1998. The fall dormancy, disease, insect, and pest ratings are presented in Table 3.

Table 3. The fall dormancy, winter hardiness, disease, insect, and pest ratings for the 1998 planted fall dormancy alfalfa variety trial conducted at COARC, Madras, OR.

Variety	FD	Bw	Vw	Fw	An	PRR	SAA	PA	BAA	SN	APH	SNKN	NRKN	RLN
Spreador III	1	4	1	4	1	1	4	2	1	3	1	1	1	1
5262	2	5	2	3	1	4	4	4	1	3	1	1	1	1
Innovator +Z	3	5	4	5	5	5	3	4	1	4	4	1	1	1
5396	4	4	4	4	5	4	4	4	1	4	1	1	3	1
Archer	5	3	3	5	4	4	5	5	4	4	1	1	4	1
Lobo	6	3	4	5	4	4	4	4	4	4	1	1	1	1

FD = Fall Dormancy, BW = Bacterial Wilt, VW = Verticillium Wilt, FW = Fusarium Wilt, AN = Anthracnose Race 1, PRR = Phytophthora Root Rot, SAA = Spotted Alfalfa Aphid, PA = Pea Aphid, BAA = Blue Alfalfa Aphid, SN = Stem Nematode, APH = Aphanomyces, SKN = Southern Root Knot Nematode, NRKN = Northern Root Knot Nematode, RLN = Root Lesion Nematode.

Fall Dormancy (FD) Ratings: 1 = most dormant, 11 = least dormant. Winter Hardiness (WH): 1 = most winter hardy, 6 = least winter hardy.

Resistance Ratings: 1 = Susceptible (S) (0-5% of plants) or has not been tested, 2 = Low Resistance (LR) (5-15%), 3 = Moderate Resistance (MR) (15-30% of plants), 4 = Resistance (R) (30-50% of plants), 5 = High Resistance (HR) (> 50% of plants)

The trial site is located about two miles north of Madras at an elevation of 2,440 ft. Eighteen pounds/acre of inoculated seed were planted with a small plot cone-type drill with 9 rows, 6-inch row spacing. The field was rolled after planting. Plot size was 5 ft by 20 ft, while harvested area was 3.5 ft by 15 ft. The trial was laid out in a randomized complete block design with eight replications.

The alfalfa was harvested with a sickle bar forage plot harvester, and fresh wet yield was weighed directly in the field. Aftermath from the plots was removed from the field the following day with a large tractor (125 hp) and grass seed “vac”. Within a day or 2 after harvest, the irrigation water was reapplied.

Moist samples (0.5-1.0 lb) were taken for each plot and dried at 145°F until no further change in weight occurred. Yields are presented on an oven-dry basis. SAS statistical software program was used for analysis of variance and results are reported using Protected Least Significant Difference (PLSD) for mean separation at the P > F = 0.01, 0.05, and 0.10 levels (SAS Institute, 1988)

The trial was solid-set, sprinkler irrigated with a 30 by 40-ft spacing as needed for establishment and during the season. Nelson rotating head Windfighter 2000 nozzles were used. Nelson rotating head Windfighter 2000, 7/64-inch size nozzles were used. The nozzles were used by mistake; we typically use a nozzle size f 9/64-inch. The7/64 production year. Irrigation is determined by crop water use prediction by the Agrimet weather station program and by probing the soil with a soil probe and using the feel test method. There is an Agrimet weather station located at the COARC, Madras. The trial was usually irrigated twice per week, depending upon time of year.

Pursuit® (1 DG Eco Pak bag), Poast® (0.47 lb ai/acre) and 2 quarts of crop oil were applied for weed control on September 18, 1998 of the establishment year. Poast (2 pints/acre) was also applied on April 7, 1999 to control volunteer triticale. The first winter dormant weed control included applying Velpar L® (0.75 lb ai/acre), Gramoxone Extra® (0.5 lb ai/acre) and Kerb® (1 lb ai/acre), on February 9, 2000. Velpar L (0.75 lb ai/acre), Kerb 50W (1 lb ai/acre), and Gramoxone Extra (0.5 lb ai/acre) were applied on November 30, 2000 for the third production year. Velpar L (0.75 a.i. lb/acre) and Gramoxone Extra (0.5 a.i. lb/acre) were applied on January 8, 2002. Gramoxone Extra (0.5 a.i. lb/acre) and Sencor® (0.5 a.i. lb/acre) were applied on February 14, 2003.

Results

There have been some irrigation problems with this trial concerning equal coverage. In 1999, there was an irrigation set that was missed during second cutting. In 2000, there was a coverage problem on the third cutting, which would have affected the fourth cutting. More coverage problems occurred in 2001. At the end of the third cutting in 2001, it was "discovered" that the source of the irrigation problem was nozzles that were too small. Between the third and fourth cutting in 2001, the nozzles were changed from 7/64-inch to 9/64–inch (Nelson rotating head Wind-fighter 2000 nozzles). Irrigation problems continued in 2002. There appeared to be no irrigation problems in 2003.

Weed control was excellent and winters were relatively mild for the 5 years of the trial. Harsh winter weather was not a factor in the trial.

Total Cumulative Yield

For total cumulative yield (5 years), the varieties (FD) were ranked 4 > 2 = 3 = 5 = 6 > 1 at the PLSD 0.10 level (Table 4). Variety FD 4 (44.97 tons/acre) was significantly higher yielding

than the FD 2, 3, 5, and 6 varieties (43.30–42.28 tons/acre range), which were significantly higher yielding than FD 1 (39.88 tons/acre).

Table 4. Total yield results of the fall dormancy alfalfa trial planted on August 25, 1998 at the Central Oregon Agricultural Research Center at Madras, Oregon.

Fall dormancy	1999 total yield (ton/acre)	1999-2000 total yield (ton/acre)	1999-2001 total yield (ton/acre)	1999-2002 total yield (ton/acre)	1999-2003 total yield (ton/acre)
4	8.74	18.36	27.48	36.23	44.97
2	8.66	18.16	26.84	35.13	43.30
3	8.50	17.57	25.72	34.12	42.80
5	8.51	17.40	25.75	33.78	42.40
6	8.56	17.56	25.72	33.77	42.28
1	8.47	16.86	24.64	32.03	39.88
Mean	8.57	17.64	26.03	34.18	42.61
PLSD 0.01	*NS*	0.96	1.05	1.49	1.99
PLSD 0.05	*NS*	0.72	0.79	1.11	1.48
PLSD 0.10	*NS*	0.60	0.66	0.93	1.23
Pr. > F	0.7722	0.0022	0.0001	0.0001	0.0001
CV%	5.0	4.0	3.0	3.2	3.4

Average Annual Cutting Yields

For annual average yield (5 years), the variety (FD) ranking was 4 > 2 = 3 = 5 = 6 > 1 based on PLSD 0.10 level (Table 5), which was the same ranking as total cumulative yield. The varieties

(FD) were significantly different for the four individual cuttings averaged over the 5 years at the PLSD 0.10 level (Table 5.) While we somewhat expected that the higher FD rated varieties would be significantly higher yielding for the fourth cutting, there were also significant differences among the varieties for average annual yield for cuttings 1-3 as well.

For first-cutting annual average yield, the variety (FD) ranking was 4 = 2 > 3 > 5 = 6 >1 (significant [S]). It seems that the middle three dormancies performed better than the lower and upper FD varieties.

For second-cutting annual average yield, the variety (FD) ranking was 4 > 6 = 2 = 5 = 3 > 1 (S). FD 1 was significantly lower yielding than the rest of the entries.

For third-cutting annual average yield, the variety (FD) ranking was 3 = 5 = 4 = 2 = 6 >1 (S). FD 1 was significantly lower yielding than the rest of the entries.

For fourth-cutting annual average yield, the variety (FD) ranking was 5 = 6 > 4 > 3 = 2 > 1 (S). The differences were close to what was expected for results; the higher dormancy rated entries produced more yield on average on the last cutting.

Table 5. Mean yield of each cutting, across 1999-2003, and total annual yield of the fall dormancy alfalfa trial planted on August 25, 1998 at the Central Oregon Agricultural Research Center at Madras, Oregon.

Fall dormancy	1st cut yield 5-yr avg. (ton/acre)	2nd cut yield 5-yr avg. (ton/acre)	3rd cut yield 5-yr avg. (ton/acre)	4th cut yield 5-yr avg. (ton/acre)	Total yield 5-yr avg. (ton/acre)
1	2.79	1.96	1.53	1.55	7.98
2	3.11	2.10	1.74	1.64	8.66
3	2.93	2.07	1.77	1.69	8.56
4	3.17	2.20	1.74	1.78	8.99
5	2.71	2.08	1.74	1.86	8.48
6	2.67	2.13	1.72	1.84	8.46
Mean	2.90	2.09	1.71	1.73	8.52
PLSD 0.01	0.20	0.11	0.14	0.11	0.40
PLSD 0.05	0.15	0.08	0.10	0.09	0.30
PLSD 0.10	0.12	0.06	0.08	0.07	0.25
Pr. > F	0.0001	0.0001	0.0004	0.0001	0.0001
CV%	5.1	3.8	5.9	5.0	3.4

1999 Results

First cutting was ranked 4 = 2 = 3 = 1 = 5 = 6 (not significant [NS]).

Second cutting was ranked 6 = 2 = 4 = 1 = 3 = 5 (NS).

Third cutting was ranked 3 = 6 = 4 = 5 = 2 = 1 (NS).

Fourth cutting was ranked 5 = 6 = 4 = 2 > 3 =1 (S). In general, the higher FD entries had higher yield than did the lower dormant entries. The FD 2 variety was a bit of a surprise, having equal yield compared to the higher nondormant entries. The fourth cutting was the only cutting in 1999 with significant differences between varieties (FD) at the PLSD 0.10 level (Table 6.).

Total yield ranking for 1999 was 4 = 2 = 6 = 5 = 3 = 1 (NS).

There were no differences in moisture between varieties for any of the cuttings.

Table 6. 1999 yield results of the fall dormancy alfalfa trial planted on August 25, 1998 at the Central Oregon Agricultural Research Center at Madras, Oregon.

Fall dormancy	1st cut yield (t/ac)	1st cut moist. (%)	2nd cut yield (t/ac)	2nd cut moist. (%)	3rd cut yield (t/ac)	3rd cut moist. (%)	4th cut yield (t/ac)	4th cut moist. (%)	Total yield (t/ac)
1	3.32	81.6	2.02	83.2	1.65	82.4	1.48	77.7	8.47
2	3.39	81.1	2.06	82.2	1.65	81.8	1.56	77.4	8.66
3	3.32	80.9	2.01	82.8	1.73	81.7	1.44	77.7	8.50
4	3.43	80.3	2.04	82.8	1.67	81.6	1.61	76.8	8.74
5	3.23	81.0	1.98	82.43	1.66	81.6	1.64	77.0	8.51
6	3.18	81.4	2.08	83.02	1.68	81.4	1.62	76.2	8.56
Mean	3.31	81.1	2.03	82.7	1.67	81.8	1.58	77.1	8.57
PLSD 0.01	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
PLSD 0.05	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	0.13	*NS*	*NS*
PLSD 0.10	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	0.11	*NS*	*NS*
Pr. > F	0.5744	0.8360	0.9131	0.1661	0.4035	0.1769	0.0155	0.1093	0.7722
CV%	9.1	2.5	9.3	1.0	5.1	0.9	8.3	1.5	5.0
Harvest date	6/4		7/13		8/18		10/14		

2000 Results

There were significant differences between yields on first cutting, fourth cutting, and total yield (Table 7).

First cutting ranked FD (varieties) 2 = 4 > 3 = 1 > 6 =5 (S). There were three yield levels and the higher nondormants did not produce.

Second cutting ranked FD 6 = 4 = 2 = 3 = 5 = 1 (NS).

Third cutting ranked FD 2 = 3 = 5 = 4 = 6 = 1 (NS).

On the fourth cutting, the varieties were ranked FD 4 = 5 = 6 = 2; 5 = 6 = 2 = 3, 3 > 1 (S). In general, the higher nondormant varieties yielded more than the dormant varieties on the last cutting.

For total yield, the varieties (FD) ranked 4 = 2 > 3 = 6 = 5 >1 (S).
There were significant moisture differences among varieties on the second, third, and fourth cuttings.

Table 7. 2000 yield results of the fall dormancy alfalfa trial planted on August 25, 1998 at the Central Oregon Agricultural Research Center at Madras, Oregon.

Fall dormancy	1st cut yield (t/ac)	1st cut moist. (%)	2nd cut yield (t/ac)	2nd cut moist. (%)	3rd cut yield (t/ac)	3rd cut moist. (%)	4th cut yield (t/ac)	4th cut moist. (%)	Total yield (t/ac)
1	2.75	79.3	2.22	82.2	1.76	77.5	1.66	76.2	8.39
2	3.14	78.2	2.38	81.4	1.98	76.1	1.99	75.6	9.50
3	2.86	78.4	2.31	81.0	1.96	76.2	1.89	76.5	9.01
4	3.10	77.7	2.45	79.9	1.91	71.1	2.15	71.8	9.61
5	2.57	78.8	2.28	80.5	1.94	74.2	2.09	73.7	8.89
6	2.60	77.9	2.47	79.8	1.89	73.6	2.05	72.1	9.00
Mean	2.84	78.4	2.35	80.8	1.90	74.8	1.97	74.3	9.06
PLSD 0.01	0.33	*NS*	*NS*	*NS*	*NS*	3.59	0.36	3.29	0.69
PLSD 0.05	0.18	*NS*	*NS*	1.42	*NS*	2.67	0.27	2.46	0.52
PLSD 0.10	0.15	*NS*	*NS*	1.18	*NS*	2.22	0.22	2.04	0.43
Pr. > F	0.0001	0.1697	0.3011	0.0136	0.4522	0.0003	0.0104	0.0005	0.0004
CV%	6.3	1.7	10.2	1.7	11.9	3.5	13.5	3.3	5.6
Harvest date	5/24		7/5		8/9		9/27		

2001 Results

There were significant differences among varieties (FD) on the first, third, and fourth cutting, and total yield based on PLSD 0.10 level (Table 8).

First cutting ranked FD 4 = 2 > 3 = 5 = 1 = 6 (S).

Second cutting ranked FD 4 = 5 = 6 = 2 = 3 = 1 (NS).

Third cutting ranked FD 2 = 4 = 5 = 6 > 3 = 1 (S).

Fourth cutting ranked FD 6 = 5 > 3 = 4 > 1 = 2 (S). The higher nondormants yielded more in general than the more dormant varieties.

Total yield ranked FD 4 > 2 > 5 = 6 = 3 > 1 (S). Perhaps the surprise here is the ranking of FD 2, especially when taken into account its rating of 2 (low resistance) for Verticilium wilt.

There was a significant difference among varieties (FD) for moisture on the first cutting.

Table 8. 2001 yield results of the fall dormancy alfalfa trial planted on August 25, 1998 at the Central Oregon Agricultural Research Center at Madras, Oregon.

Fall dormancy	1st cut Yield (t/ac)	1st cut Moist. (%)	2nd cut Yield (t/ac)	2nd cut Moist. (%)	3rd cut Yield (t/ac)	3rd cut Moist. (%)	4th cut Yield (t/ac)	4th cut Moist. (%)	Total Yield (t/ac)
1	2.66	80.1	2.30	80.2	1.24	77.4	1.59	76.9	7.78
2	3.06	78.8	2.54	81.9	1.51	74.2	1.58	77.3	8.69
3	2.76	79.7	2.48	81.9	1.33	74.9	1.63	77.4	8.21
4	3.26	76.0	2.62	79.6	1.50	71.3	1.75	76.7	9.13
5	2.65	79.1	2.38	81.5	1.46	75.0	1.86	76.6	8.35
6	2.53	79.0	2.38	80.6	1.43	74.7	1.82	76.2	8.17
Mean	2.82	78.8	2.45	80.9	1.41	74.6	1.70	76.9	8.38
PLSD 0.01	0.33	2.8	*NS*	*NS*	*NS*	*NS*	0.13	*NS*	0.51
PLSD 0.05	0.25	2.1	*NS*	*NS*	0.17	*NS*	0.10	*NS*	0.38
PLSD 0.10	0.21	1.7	*NS*	*NS*	0.14	*NS*	0.08	*NS*	0.31
Pr. > F	0.0001	0.0072	0.1846	0.1846	0.0200	0.1267	0.0001	0.4749	0.0001
CV%	8.6	2.6	2.7	2.7	11.9	5.4	5.8	1.7	4.5
Harvest date	5/31		7/11		8/13		10/15		

2002 Results

There were significant differences among varieties (FD) on all four cuttings and total yield (Table 9). First cutting ranked FD 4 = 2 = 3 > 1 = 6 = 5 (S). The mid-rated dormancies were higher yielding than the lower and higher numbered FD varieties.

Second cutting ranked FD 4 = 5 = 6 > 2 = 3 >1 (S). The nondormants were higher yielding than the three lower numbered dormant varieties. Third cutting ranked FD 3 = 5 = 6 = 4 = 2 > 1 (S). The FD 1 variety was lower yielding than the rest of the entries.
Fourth cutting ranked FD 6 = 5 > 3 = 4 > 1 = 2 (S). There were three yield levels and they were significantly different. In general, as FD number increased, yield increased.

Total yield ranked FD 4 (almost > than, but) = 3, 3 = 2 = 6 = 5 > 1 (S). The mid-range FD varieties were the highest yielding, with the lower and higher numbered FD varieties the lowest yielding.

There were no significant differences in moisture among varieties (FD) for moisture in any cutting.

Table 9. 2002 yield results of the fall dormancy alfalfa trial planted on August 25, 1998 at the Central Oregon Agricultural Research Center at Madras, Oregon.

Fall dormancy	1st cut yield (t/ac)	1st cut moist. (%)	2nd cut yield (t/ac)	2nd cut moist. (%)	3rd cut yield (t/ac)	3rd cut moist. (%)	4th cut yield (t/ac)	4th cut moist. (%)	Total yield (t/ac)
1	2.64	79.0	1.53	84.9	1.51	78.5	1.71	76.9	7.39
2	3.14	77.3	1.70	84.9	1.78	80.1	1.68	76.1	8.29
3	3.01	78.3	1.63	85.0	1.93	78.7	1.82	76.2	8.39
4	3.31	77.4	1.84	84.4	1.80	79.1	1.80	76.6	8.75
5	2.48	78.5	1.79	84.5	1.83	79.1	1.93	76.0	8.03
6	2.51	78.2	1.78	84.6	1.81	78.3	1.96	76.6	8.05
Mean	2.85	78.1	1.71	84.7	1.77	78.9	1.81	76.4	8.15
PLSD 0.01	0.41	*NS*	0.13	*NS*	0.24	*NS*	0.14	*NS*	0.89
PLSD 0.05	0.31	*NS*	0.10	*NS*	0.18	*NS*	0.11	*NS*	0.45
PLSD 0.10	0.25	*NS*	0.08	*NS*	0.15	*NS*	0.09	*NS*	0.37
Pr. > F	0.0001	0.1291	0.0001	0.1141	0.0014	0.2977	0.0001	0.6326	0.0001
CV%	10.5	1.8	5.5	0.6	9.9	2.0	5.7	1.5	5.4
Harvest deate	6/3		7/3		8/7		10/8		

2003 Results

There were significant differences among the first, second, and fourth cutting, and total yield at the PLSD 0.10 level (Table 10).

First cutting ranked 2 = 4 = 3, 3 = 5, 5 = 1 = 6 (S). The mid-range FD types outyielded the more "extreme" FD types.

Second cutting ranked 4 = 5 = 6 = 3 > 2 =1 (S). The nondormants, in general, outyielded the more dormant varieties.

Third cutting ranked 3 = 4 = 6 = 5 = 1 = 2 (NS).

Fourth cutting ranked 5 = 6 = 3, 5 and 6 > 4, 3 = 4 > 2 = 1 (S). In general, the higher nondormant varieties were higher yielding on the last cutting.

Total yield ranked 4 = 3 = 5 = 6, 3 > 2, 5 > 1, 2 = 5, 2 = 1 (S).

There were significant differences among FD varieties for moisture in the first and fourth cutting.

Table 10. 2003 yield results of the fall dormancy alfalfa trial planted on August 25, 1998 at the Central Oregon Agricultural Research Center at Madras, Oregon.

Fall dormancy	1st cut yield (t/ac)	1st cut moist. (%)	2nd cut yield (t/ac)	2nd cut moist. (%)	3rd cut yield (t/ac)	3rd cut moist. (%)	4th cut yield (t/ac)	4th cut moist. (%)	Total yield (t/ac)
1	2.58	78.7	1.72	83.2	2.21	70.1	1.33	77.0	7.85
2	2.82	77.9	1.79	82.7	2.17	70.9	1.37	76.3	8.18
3	2.69	78.2	1.93	82.7	2.40	71.3	1.67	77.8	8.69
4	2.74	77.0	2.04	81.9	2.35	70.4	1.60	77.5	8.74
5	2.59	77.7	1.99	82.6	2.28	70.4	1.76	77.6	8.62
6	2.51	78.0	1.96	82.9	2.29	70.6	1.75	77.7	8.51
Mean	2.66	77.9	1.91	82.7	2.28	70.6	1.58	77.3	8.43
PLSD 0.01	*NS*	*NS*	*0.21*	*NS*	*NS*	*NS*	0.22	*NS*	*NS*
PLSD 0.05	0.20	0.91	0.16	*NS*	*NS*	*NS*	0.16	0.74	0.56
PLSD 0.10	0.16	0.76	0.13	*NS*	*NS*	*NS*	0.13	0.62	0.45
Pr. > F	0.0298	0.0202	0.0014	0.7215	0.3356	0.7139	0.0001	0.0012	0.0179
CV%	7.3	1.2	8.1	1.9	16	2.2	10.0	0.9	6.6
Harvest date	6/5		7/9		8/13		10/20		

Discussion

Selecting an alfalfa variety for an individual field is important. Part of that selection process is selecting a variety for its yield and quality potential, pest resistance rating, and as well as its fall dormancy rating. How the variety yields on each cutting over the years may be important, or

maybe only total yield at the end of each year or at the end of the production cycle is usually the biggest justification for selection.

Selecting a higher rated nondormant variety that yields more on last cutting may or may not be justified, if the variety is lower yielding on earlier cuttings. Potential income would need to be considered for the value of the hay on each cutting (based on quality). While we had significantly higher yield for the higher rated nondormants on last cutting, we also had significantly less yield on first cutting.

It is important to note that the results are only from a single variety representing a FD rating. There are other variety genetic factors that could influencethe results. However, the trial does begin to add to the information database for the production of alfalfa in central Oregon.

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