

## **Alfalfa Variety Performance at the Dickinson Research Extension Center - Manning Ranch, ND**

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### **Abstract**

Dry matter yields from 23 different alfalfa varieties grown at the Dickinson Research Extension Center - Manning Ranch were compared under dryland conditions. No significant differences in dry matter yield were detected at the 5% level.

### **Introduction**

In 1996, North Dakota counties south and west of the Missouri River produced alfalfa hay on 778,500 acres with an average yield of 1.6 tons per acre. New varieties with improved agronomic characteristics have been released. Producers are questioning whether the new varieties will produce as much as Vernal, a common public variety. Little information is available on performance of these new varieties under a limited water environment such as that which is found in southwestern North Dakota.

### **Procedure**

Representatives from Cenex, Northrup King, Agri-Pro, Interstate, Pioneer, and Cargill provided varieties that they thought to be adapted to western North Dakota in 1995 ([Table 1](#)). In addition to the commercial varieties seeded in 1995, three public varieties were included. In 1996, DeKalb, Keltgen Seed, and Northrup King provided seed of additional varieties ([Table 1](#)). Varieties were seeded in a randomized complete block design to evaluate potential difference in dry matter yield. Vernal, a public variety which is commonly grown, was used as a check variety in both plantings.

Plots were seeded into standing oat stubble that had been hayed the preceding year. Glyphosate (Roundup) was applied as a "burn down"

herbicide to control early season weed growth prior to direct seeding with a John Deere 750 no-till drill. Forty pounds of 18-46-0 was placed with the seed.

Two cuttings were made in 1997. Cutting dates were June 10, for the first cutting and July 25, for the second cutting. A flail forage plot harvester was used to cut samples from a measured area in each plot. Samples were then oven dried to determined the percent dry matter weight, yield and relative yield calculated.

## Results and Discussion

The 1995 entries produced a total average yield of 3.6 tons per acre from two cuttings in the initial year of seeding (data not shown). In 1996, both the 1995 seeding and the 1996 seeding produced one cutting. The 1995 seeding produced an average yield of 1.5 tons per acre and the 1996 seeding produced less than 1.0 ton per acre (data not shown).

No significant differences between varieties were detected at the 5% level for first and second cutting and for total yield produced for 1997 ([Table 2](#)). Yield of first cutting alfalfa was affected by below normal precipitation in May and early June. First cutting was made when alfalfa plants were in 20% bloom, wilting, dropping leaves and going into dormancy due to the lack of stored soil water and precipitation. Toward the end of June and during July, above normal precipitation was received and helped produce and average yield of 1.3 to 1.5 ton per acre for the second cutting. Total yields of 1.9 to 2.1 ton per acre in 1997 exceeded 1996 yields.

It is interesting to note that first cutting yield of Vernal in the 1996 seeding exceeded that of the same variety in the 1995 seeding. Probably the root system in the 1996 seeding would not have been as well developed in 1996 as the 1995 seeding and therefore would not have utilized as much stored soil moisture as the 1995 seeding. In 1997, root development continued and extracted moisture stored from previous years.

Water is a limiting factor that may prevent improved alfalfa varieties from exhibiting superior performance. During growing seasons with above normal precipitation which fully meet the requirements of alfalfa and fertility is sufficient, improved varieties may out perform older varieties.

Table 1. Agronomic characteristics of selected alfalfa varieties grown at the Dickinson Research Extension Center Ranch, Manning, ND.												
Variety	Company	FD	BW	VW	FW	AN	PR	SA	PA	SN	AP	NR
120	DeKalb	3	hr	-	r	lr	r	-	r	-	-	-

5262	Pioneer Hi-Bred	2	hr	lr	mr	-	r	r	r	mr	-	-
5364	Pioneer Hi-Bred	4	r	mr	r	mr	mr	hr	hr	r		-
5454	Pioneer Hi-Bred	4	r	mr	hr	hr	hr	r	r	mr	lr	-
Allegiance	Keltgen Seed/Lynks Seed	3	4	4	4	hr	r	r	r	r	-	-
Avalanche +z	America's Alfalfa	2	hr	hr	hr	hr	hr		r	mr	r	-
Blazer XL	Cenex/Land O' Lakes	3	r	r	hr	hr	hr	hr	r	r	r	-
Cenex 740	Cenex/Land O' Lakes	3	r	r	r	r	-	-	-	-	-	-
Cenex MG	Cenex/Land O' Lakes	2	1	lr	2	3	-	-	-	-	-	-
200	Lakes	-	-	-	-	-	-	-	-	-	-	-
Crown II	Cargill	3	hr	r	hr	hr	-	-	-	-	-	-
Cut/Graze	Agri-Pro	3	r	lr	hr	mr	r	-	r	mr	r	-
Defiant	Agri-Pro	2	hr	hr	hr	r	hr	-	r	mr	r	-
DK 127	DeKalb	3	hr	r	r	hr	hr	hr	hr	r	hr	r
Ladak 65	Public	1	mr	s	s	s	-	-	-	-	-	-
LegenDairy	Cenex/Land O' Lakes	2.5	hr	hr	hr	hr	hr	-	-	-	-	-
NK 919 Rangeland	Northrup King	blend	-	-	-	-	-	-	-	-	-	-
NK 919-10	Northrup King	blend	-	-	-	-	-	-	-	-	-	-
Proof	Keltgen Seed	3	hr	r	hr	hr	hr	r	r	-	r	-
Rainier	Northrup King	3	hr	r	hr	hr	hr	hr	hr	r	hr	r

Ranger	Public	3	-	-	-	-	-	-	-	-	-	-	-
Spreador III	Northrup King	1	hr	mr	hr	r	mr	s	mr	mr	s	-	-
Sterling	Cargill	2	hr	r	hr	hr	hr	r	r	-	r	-	-
Vernal	Public	2	r	-	mr	-	-	-	-	-	-	-	mr

### Column headings

FD = Fall Dormancy  
 BW = Bacterial Wilt  
 VW = Verticillium Wilt  
 FW = Fusarium Wilt  
 AN = Anthracnose Race 1  
 PR = Phytophthora Root Rot  
 SA = Spotted Alfalfa Aphid  
 PA = Pea Aphid  
 SN = Stem Nematode  
 AP = Aphanomyces Root Rot Rate 1  
 NR = Northern Root Knot Nematode

### Fall Dormancy Ratings

### Check Variety Dormancy Rating

**Norseman = 1**  
**Vernal = 2**  
**Ranger = 3**  
**Saranac = 4**  
**Dupuits = 5**

### Pest resistance ratings

#### % Resistance Plants Resistance Class

0-5% Susceptible (s)  
 6-14% Low Resistance (lr)  
 15-30% Moderate Resistance (mr)  
 31-50% Resistance (r)  
 < 50% High Resistance (hr)

**Table 2. 1997 dry matter yields of alfalfa varieties at Manning, North Dakota.**

Entry	Cutting Date		-	Relative Yield		-
	6/10	7/25	Total	6/10	7/25	Total
	-----tons dry matter/acre-----			-----% of Vernal-----		
<b>1995 Planting</b>						
Sterling	0.52	1.74	2.26	124	123	123
Ranger	0.58	1.61	2.19	1.38	114	120
Blazer XL	0.71	1.41	2.12	169	100	116
Defiant	0.49	1.58	2.07	117	112	113
NK919 Rangeland	0.57	1.50	2.07	136	106	113
5364	0.50	1.50	2.00	119	106	109
Spreador III	0.32	1.63	1.95	76	116	107
5262	0.33	1.61	1.94	79	114	106
740	0.45	1.44	1.89	107	102	103
MG 2000	0.38	1.47	1.85	90	104	101
Vernal	0.42	1.41	1.83	-	-	-
NK919-10	0.37	1.45	1.82	88	103	99
Avalanche + z	0.40	1.37	1.77	95	97	97
Cut/Graze	0.29	1.40	1.69	69	99	92
LegenDairy	0.30	1.34	1.64	71	95	90

Crown II	0.35	1.28	1.63	83	91	89
Ladak	0.29	1.27	1.56	69	90	85
Mean	0.43	1.47	1.90	-	-	-
LSD .05	NS	NS	NS	-	-	-
CV%	38.5	12.6	15.4	-	-	-

### 1996 Planting

120	0.94	1.49	2.43	108	108	108
Vernal	0.87	1.38	2.25	-	-	-
Proof	0.81	1.31	2.12	93	95	94
Rainier	0.84	1.28	2.12	97	93	94
5454	0.83	1.25	2.08	94	91	92
Allegiance	0.71	1.23	1.94	82	89	86
DK 127	0.65	1.16	1.81	75	84	80
Mean	0.81	1.30	2.11	-	-	-
LSD .05	NS	NS	NS	-	-	-
CV%	14.0	9.3	10.7	-	-	-

### Precipitation (inches)

April -- 2.89; May -- 0.95; June -- 5.02; July -- 5.41

### Average Estimated Plant Available Water

May 8, 1997 - 1.80"

### Stage of Development:

**1<sup>st</sup> cutting ~ 20% bloom and wilting due to dry soil conditions; 2<sup>nd</sup> cutting ~ 40% bloom.**

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