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ALFALFA VARIETY DEMONSTRATION TRIAL
DICKINSON RESEARCH EXTENSION CENTER MANNING RANCH, 1995-96

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ABSTRACT

Seventeen alfalfa varieties were established in 1995 and an additional seven alfalfa varieties were established in 1996. Alfalfa varieties planted in 1995 were harvested and dry matter yields recorded in 1995 and 1996. Alfalfa varieties planted in 1996 were bulk harvested. The 1995 planting produced 3.00 and 1.76 tons of dry matter per acre in 1995 and 1996, respectively. No significant differences in dry matter yields were detected in 1996. The estimated dry matter yield of the 1996 planting was 1.00 to 1.50 tons per acre in the year of establishment.

INTRODUCTION

North Dakota counties south and west of the Missouri River produced alfalfa hay on 675,000 acres with an average yield of 1.54 tons per acre in 1994 (Beard and Hamlin, 1995). 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 limited water environments such as those found in southwestern North Dakota.

MATERIALS AND METHODS

An alfalfa demonstration trial was initiated at the Dickinson Research Extension Center Manning Ranch in the spring of 1995. Alfalfa varieties were submitted by representatives from Cenex, Northrup King, Agri-Pro, Interstate, Pioneer, and Cargill for use in the demonstration trial (Table 1). Plots were seeded into standing oat stubble on May 17, 1995 using a John Deere 750 no-till drill. Forty pounds of 18-46-0 was placed with the seed. Precipitation was measured at the Dickinson Research Extension Center - Manning Ranch Head Quarters which is located approximately 2.6 miles east of the alfalfa plots (Table 2).

Harvest in 1995 occurred on or about August 24. Samples were hand harvested from representative 0.25 m^2 area within the plots. Samples were then air dried and weighed. Weights were adjusted by 12 percent to calculate dry matter yield and relative yield calculated. A statistical analysis of the 1995 data was not performed.

A flail forage harvester was used in 1996 to harvest an area that was two feet by 55 feet from each plot on June 20. A wet weight for each plot was recorded and a sample of wet material was oven dried. Dry matter yield and the relative yields were then calculated. A statistical analysis was conducted using SAS ver 6.12 of the 1996 data.

RESULTS

Dry matter yields and relative yields for 1995 and 1996 are listed in Table 3. Yields in 1995 were within a range that would be expected with 17.69 inches of water plus any additional water that the previous oat crop had not utilized. Four to six inches of water is required per ton of alfalfa yield (Orloff et. al., 1995; Doorenbos et. al., 1979). Expected dry matter yields were 2.95 to 4.42 tons per acre in 1995. In 1996, 7.71 inches of precipitation was available to the crop therefore expected yield was 1.29 to 1.93 tons per acre. The actual mean dry matter yield of the 1995 planting was 3.00 and 1.76 tons per acre in 1995 and 1996, respectively.

No significant differences were detected in dry matter yields in 1996. Dry conditions severely limited yield development. Though newer varieties may have superior genetics, severe dry conditions may have limited expression in terms of dry matter yield.

Table 1. Dormancy and pest resistance ratings for selected alfalfa varieties grown at DREC -

Manning Ranch, ND.

Variety	Company	FD	Bw	Vw	Fw	An	PR	SA	PA	SN	AP	NR
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		
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 200	Cenex/Land O' Lakes	2	1	LR	2	3						
Crown II	Cargill	3	HR	R	HR	HR						
Cut/Graze	Agri-Pro	3	R	LR	HR	MR	R		R	MR	R	
Defiant	AgriPro	2	HR	HR	HR	R	HR		R	MR	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										
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

FD = Fall Dormancy	An = Anthracnose Race 1	SN = Stem Nematode
Bw = Bacterial Wilt	PR = Phytophthora Root Rot	AP = Aphanomyces Root Rot Rate 1
Vw = Verticillium Wilt	SA = Spotted Alfalfa Aphid	NR = Northern Root Knot Nematode
Fw = Fusarium Wilt	PA = Pea Aphid	

Fall dormancy ratings				
Check Variety	**Rating**		**Check Variety**	**Rating**
Norseman	1		Saranac	4
Vernal	2		Dupuits	5
Ranger	3			

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. Precipitation at the Dickinson Ranch HQ from 1994 through 1996.

Month	1994	1995	1996
January	0.86	0.14	0.78
February	0.33	0.13	0.26
March	0.38	0.83	1.24
April	0.86	1.01	0.14
May	1.46	4.32	3.07
June	4.51	0.68	1.86
July	1.07	4.62	2.55
August	0.31	3.16	1.72

September	1.08	0.00	2.51
October	4.58	0.67	0.09
November	0.52	0.43	0.81
December	0.18	0.25	0.22
Total	16.14	16.24	15.25
Oct previous year [illegible] cut date current year	-----	17.69	7.71

Table 3. Dry matter yields for alfalfa varieties grown in 1995 and 1996 at Manning, ND.

	1995[1]		1996[2]		1995[illegible]96 Average	
	Dry matter	Relative yield	Dry matter	Relative yield	Dry matter	Relative yield
	ton/acre	% of Vernal	ton/acre	% of Vernal	ton/acre	% of Vernal
1995 Planting						
Spreador III	3.81	114	1.59	87	2.70	104
740	3.60	107	1.72	94	2.66	103
5364	3.40	101	1.80	98	2.60	100
5262	3.08	92	2.09	114	2.59	100
Vernal	3.35	--	1.83	--	2.59	--
Blazer XL	3.35	100	1.78	97	2.57	99

Ranger	3.08	92	1.82	99	2.45	95
Crown II	3.07	92	1.75	96	2.41	93
Sterling	3.02	90	1.76	96	2.39	92
Cut/Graze	2.68	80	1.95	107	2.32	90
MG 2000	3.04	91	1.56	85	2.30	89
LegenDairy	2.71	81	1.85	101	2.28	88
Defiant	2.71	81	1.69	92	2.20	85
Avalanche + z	2.76	82	1.63	89	2.20	85
NK919-10	2.49	74	1.71	93	2.10	81
NK919 Rangeland	2.49	74	1.64	90	2.07	80
Ladak	2.41	72	1.68	92	2.05	79
Mean	3.00		1.76		2.38	
CV%	--		13.0			
LSD.05	--		NS			

[1]Harvested on August 24, 1995 and analyzed by R.J. Theis and G. Ottmar.

[2]Harvested at 10 to 20% bloom on June 20, 1996 and analyzed by C. Poland and L. Tisor.

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