

ALFALFA MANAGEMENT TRIAL

Alfalfa is one of the most important forages harvested as hay or utilized by grazing animals in North Dakota. A substantial amount of data are available regarding varietal differences with respect to yields and stand performance. Relatively little is known about the proper management of alfalfa with respect to intensity and frequency of harvest for maximum yields, forage quality, and winter kill. Depleted root reserves due to fall grazing and too frequent summer harvesting are probable reasons for a high percentage of winter kill in this area. A trial was initiated in an attempt to elucidate some of the reasons for this phenomenon while gaining some information with regard to some of the other problems mentioned earlier.

The trial was planted in 1967 and data were initially taken in 1969. Ladak alfalfa was planted in 13 separate plots with 30 treatments superimposed on these plots. The 30 treatments included cutting combinations of a single cutting when plants were in full bloom, 2 cuttings consisting of full bloom and mid-September to mid-October at 15-day intervals, 2 cuttings including mid-June and early August, 2 cuttings including late June and late August, and an additional cutting applied to the 2-cutting date sequence at successively later intervals. In addition to the different cutting-date treatments, a single 46 lbs. P / acre treatment was added to the trial in the 1971 season. Cutting dates were selected in a manner which included various stages of maturity, regrowth and flowering.

Table 1 shows the time of harvest and forage yields for the 1971 season. The harvest treatment showing the highest total forage yield for the trial was the June 20-August 10-October 1 harvest dates at 9169 pounds per acre. The lowest yielding combination was the June 30-August 30-September 15 cutting treatments at 5909 pounds per acre. The 2-year average data showed essentially the same results for the highest yielding treatment. The low yielding treatment for the 3-year period was the full bloom (7-15) cutting date (Table 2).

Table 1. Yield and Response to Cutting of Ladak Alfalfa at Varying Dates, Frequency, and Stages of Bloom – 1971 Season

Treatments (Cutting Dates)	Dry-Weight Yield - lbs. / acre			Total All Clippings		
	Alfalfa	Weeds	Total	Alfalfa	Weeds	Total
6-20	4508	134	4642			
8-10	3429	8	3437	8079	142	8221
6-20	4996	83	5079			
8-10	3108	----	3108	8104	83	8187
9-15	No regrowth					
6-20	5120	30	5150			
8-10	3484	----	3484	9139	30	9169
10-1	535	----	535			
6-20	4558	57	4615			
8-10	3206	----	3206	7764	57	7821
10-15	No Regrowth					
6-30	4587	109	4696			
8-30	1715	8	1723	6302	117	6419
6-30	3927	92	4019			
8-30	1877	13	1890	5804	105	5909
9-15	No Regrowth					
6-30	4733	129	4862			
8-30	1772	5	1777	6505	134	6639
10-1	No Regrowth					
6-30	4335	125	4460			
8-30	2672	13	2685	7007	138	7145
10-15	No Regrowth					
Full bloom (7-15)	6442	75	6517	6442	75	6517
Full bloom	5943	----	5943			
9-15	1602	----	1602	7545	----	7545
Full bloom	5833	20	5853			
10-1	1442	----	1442	7275	20	7295
Full bloom	6980	----	6980			
10-15	1692	----	1692	8672	----	8672
46 lbs. Phos.	5031	146	5177	5031	146	5177

Table 2. Average Yield and Response to Cutting of Ladak Alfalfa at Varying Dates, Frequency, and Stages of Bloom - 1969-1971 Seasons

Treatments (Cutting Dates)	Dry-Weight Yield - lbs. / acre			Total All Clippings		
	Alfalfa	Weeds	Total	Alfalfa	Weeds	Total
6-20	3524	54	3578			
8-10	3187	8	3195	6711	62	6773
6-20	3984	49	4033			
8-10	3199	15	3214	7728	64	7792
9-15	545	----	545			
6-20	4038	49	4087			
8-10	3637	4	3641	7981	53	8034
10-1	306	----	306			
6-20	3748	29	3777			
8-10	3218	4	3222	7484	33	7517
10-15	518	----	518			
6-30	4094	71	4165			
8-30	2473	11	2484	6567	82	6649
6-30	3828	43	3871			
8-30	2374	4	2378	6202	47	6249
9-15	No Regrowth					
6-30	4028	65	4093			
8-30	2655	116	2771	6683	181	6864
10-1	No Regrowth					
6-30	4112	47	4159			
8-30	2809	63	2872	6921	110	7031
10-15	No Regrowth					
Full bloom (7-15)	4936	212	5148	4936	212	5148
Full bloom	4984	33	5017			
9-15	2109	2	2111	7093	35	7128
Full bloom	4466	248	4714			
10-1	2024	----	2024	6490	248	6738
Full bloom	5110	119	5229			
10-15	2125	13	2138	7235	132	7367
46 lbs. Phos. ^{1/}	5031	146	5177	5031	146	5177

^{1/} 1971 data only.

Cutting treatments including mid-June and early August generally resulted in the maximum yields for the alfalfa. Initial cutting dates started later than June 20 and mid-August resulted in yields appreciably lower than the earlier starting dates. Regrowth on plots with June and August cutting treatments seldom attained enough height for a third harvest. However, alfalfa harvested initially when in full bloom attained enough regrowth for a substantial yield in mid-September or early to mid-October.

The second harvest of the early summer and mid-summer plots was generally considerably less than the first harvest. However, the decrease in amount of forage may be compensated for, at least partially, for an increased quality associated with second and third cuttings of alfalfa. Yields from full bloom harvests were generally greater than those from earlier plots although quality of the greater yields may be considerably lower due to the late harvest dates. Second cuttings were likewise substantially lower employing the full-bloom and late summer date treatments than was observed on the other harvest-date treatments. The performance of the alfalfa was greatly influenced in any given season by the annual climate. Mid-summer rains generally were decisive in obtaining a high yielding second harvest or perhaps a third. Annual variations in moisture and temperature during the course of this trial thus far have been great enough to obscure any definite trends in yield and performance characteristics. At the present time no stand deterioration due to different cutting treatments has become evident. It is anticipated that the trial will be continued for another season or longer in order to determine more accurately the degree of winter kill and associated yield reduction if and when it occurs. It is of utmost importance to farmers and ranchers of western North Dakota to manage alfalfa in a manner consistent with highest yields possible, best forage quality, and optimum stand preservation.