

ALFALFA MANAGEMENT TRIAL

A considerable amount of information is available with regard to yields and performance of different varieties of alfalfa. Alfalfa is perhaps the single most important forage crop planted for hay in western North Dakota and in many other areas of the Northern Great Plains. Alfalfa is utilized mainly as hay for winter livestock feed and in grass mixture for spring and summer grazing. Performance of this plant with regard to different cutting dates has not been thoroughly researched and little is known about its response under different harvest management systems. Too late harvesting of alfalfa generally weakens the plant's ability to recover and death may result. This is often due to severe defoliation which will not allow the plant to store food reserves in the roots for the following season's growth. It is believed that an appreciable amount of winter kill may be due to the improper management of alfalfa, usually because of late summer cutting or fall grazing. This trial was initiated to determine the proper cutting time and maximum yield for alfalfa as a hay crop.

The alfalfa for this trial was planted in 1967 and the first yield data were collected in 1969. No data were taken in 1968 due to an uneven and spotty stand. The trial consists of 13 plots with a combination of 31 treatments, arranged in a random block design. Cutting dates were selected in a manner which would include various stages of maturity, regrowth, and bloom.

The data in Table 1 showed the highest total yield in 1970 was obtained from a combination of cuttings consisting of June 30 and August 30. Slightly lower yields were obtained on the plots combining the June 30 and August 30 cutting dates with an additional harvest on September 15 and October 1. Regrowth of the alfalfa on these plots following the August 30 cutting was not great enough to warrant harvest at the later dates in either 1969 or 1970. (Compare Tables 1 and 2).

An earlier cutting date of about 10-15 days (June 20, August 10, September 15, or October 1) resulted in allowing adequate regrowth for 3 cuttings. However, the third harvest was extremely small when compared with the yields from the earlier cuttings. A similar response was observed in both years of the

trial (Table 3). The average total yields from this combination of cutting dates was high in 1969 but considerably lower in 1970 than was observed from just the June 20-August 30 combination plots. This perhaps is a strong reflection on the rainfall distribution in both years of the study. The 2-year average data showed the yields to be greatest when combining the June 20, August 10, and late fall cutting dates (Table 3).

The yield data over the 2-year period showed that a single cutting of alfalfa when in full bloom results in the lowest total yield of any of the other cutting combinations. (Tables 1-3). Full bloom cuttings plus one late summer or fall cutting showed average yields only slightly lower than those obtained with early and mid-summer combined cuttings. However, the quality of the forage from alfalfa in full bloom may be considerably lower than that from earlier cuttings, which may greatly lessen the value of the hay despite the high yields.

An approximate 50 percent reduction in yield was observed in the second cutting of the alfalfa in 1970 on the early and mid-summer plots (Table 1). Second cuttings from the full bloom coupled with late summer or fall cuttings showed much greater reductions in yield in 1970. Generally, the opposite situation was observed over the entire trial in 1969 when yields from the second cuttings were generally appreciably greater than those from the first harvest (Table 2). Moisture conditions were considerably more favorable for regrowth in 1969 than was observed in 1970.

The management trial will be continued for a number of years to better assess the response of alfalfa to varying times of defoliation during the growing season. The effect of cutting on stage development, and the ability of the alfalfa to recover sufficiently to prevent winter kill, is of prime importance to farmers and ranchers of western North Dakota. Proper management of alfalfa will prevent stand deterioration while allowing the harvesting of maximum production and optimum forage quality under dryland conditions.

Table 1. Yield and response to cutting of Ladak alfalfa at varying dates, frequency, and stages of bloom – 1970 season.

Treatments (cutting dates)	Dry-weight yield-lbs/acre			Total all clippings		
	Alfalfa	Weeds	Total	Alfalfa	Weeds	Total
6-20	3729	0	3729			
8-10	2461	6	2467	6190	6	6196
6-20	4107	40	4147			
8-10	2685	46	2731	7025	86	7111
9-15	233	0	233			
6-20	3994	99	4279			
8-10	2964	0	2788	7340	99	7439
10-1	382	0	382			
6-20	4260	19	4279			
8-10	2770	11	2788	7037	30	7067
10-15	No regrowth					
6-30	5531	14	5545			
8-30	2587	7	2594	8118	21	8139
6-30	5638	23	5661			
8-30	2318	0	2318	7956	23	7979
9-15	No regrowth					
6-30	5387	38	5425			
8-30	2528	114	2642	7915	152	8067
10-1	No regrowth					
6-30	5441	12	5453			
8-30	2433	0	2433	7874	12	7886
10-15	No regrowth					
Full bloom (7-11)	5521	7	5528	5521	7	5528
Full bloom 9-15	5831 1443	10 0	5841 1443	7274	10	7284
Full bloom 10-1	5300 1538	0 0	5300 1538	6838	0	6838
Full bloom 10-15	6217 1384	0 0	6217 1384	7601	0	7601

Table 2. Yield and response to cutting of Ladak alfalfa at varying dates, frequency, and stages of bloom – 1969 season

Treatments (cutting dates)	Dry-weight yield-lbs/acre			Total all clippings		
	Alfalfa	Weeds	Total	Alfalfa	Weeds	Total
6-20	2334	28	2362			
8-10	3670	10	3680	6004	38	6042
6-20	2848	23	2871			
8-10	3803	0	3803	8054	23	8077
9-15	1403	0	1403			
6-20	3000	17	3017			
8-10	4462	12	4474	9459	29	9488
10-1	1997	0	1997			
6-20	2427	10	2437			
8-10	3678	0	3678	7660	10	7670
10-15	1555	0	1555			
6-30	2165	91	2256			
8-30	3117	17	3134	5282	108	5390
6-30	1920	15	1935			
8-30	2928	0	2928	4848	15	4863
9-15	No regrowth	No growth	No growth			
6-30	1963	29	1992			
8-30	3664	228	3892	5627	257	5884
10-1	No regrowth	No growth	No growth			
6-30	2561	4	2565			
8-30	3322	175	3497	5883	179	6062
10-15	No growth	No growth	No growth			
Full bloom (7-11)	2845	554	3399	2845	554	3399
Full bloom 9-15	3179 3281	88 6	3267 3287	6460	94	6554
Full bloom 10-1	2265 3092	725 0	2990 3092	5357	725	6082
Full bloom 10-15	2134 3299	357 38	2491 3337	5433	395	5828

Table 3. Average yield and response to cutting of Ladak alfalfa at varying dates, frequency, and stages of bloom – 1969-1970 seasons.

Treatments (cutting dates)	Dry-weight yield-lbs/acre			Total all clippings		
	Alfalfa	Weeds	Total	Alfalfa	Weeds	Total
6-20	3032	14	3046			
8-10	3066	8	3074	6098	22	6120
6-20	3478	32	3510			
8-10	3244	23	3267	7540	55	7595
9-15	818	0	818			
6-20	3497	58	3555			
8-10	3713	6	3719	8400	64	8464
10-1	1190	0	1190			
6-20	3344	15	3359			
8-10	3228	6	3234	7350	20	7370
10-15	778	0	778			
6-30	3848	53	3901			
8-30	2852	12	2864	6700	65	6765
6-30	3779	19	3798			
8-30	2623	0	2318	6402	19	6421
9-15	No regrowth					
6-30	3675	34	3709			
8-30	3097	171	3267	6772	205	6977
10-1	No regrowth					
6-30	4001	8	4009			
8-30	2878	88	2966	6879	96	6975
10-15	No regrowth					
Full bloom (7-11)	4183	281	4464	4183	281	4464
Full bloom 9-15	4505 2362	49 3	4554 2365	6867	52	6919
Full bloom 10-1	3783 2315	363 0	4146 2315	6098	363	6461
Full bloom 10-15	4176 2342	179 19	4355 2361	6518	198	6716