

ALFALFA FALL CUTTING MANAGEMENT

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Past recommendations for alfalfa fall cutting management have suggested a period of 4-6 wks growth prior to the first killing frost as necessary for alfalfa survival in the North East. Research has indicated that this period growth prior to the frost enables the plants to build up carbohydrate reserves to carry them through the winter and provides energy for regrowth in the spring. If a fall cut is desired, it was suggested that it be taken after the killing frost.

Recent research suggests that it is the length of the regrowth period following the third cut, rather than the length of time prior to the killing frost which is critical to alfalfa winter survival and stand life. Research from Pennsylvania State University recommends that if a 45-50 day regrowth period has accumulated since the last harvest, a fall cut can safely be taken within the four weeks period prior to the killing frost. Two experiments have been set up at the University of Massachusetts's South Deerfield Research Farm to test this recommendation under Massachusetts Climatic Conditions.

Both experiments were seeded in August 1983, with 16 kg/ha of Saranac AR alfalfa. The plots were managed so that the third harvest was taken at first flower to 10% bloom before August 30th. Fall cutting treatments and potassium fertility treatments were imposed in 1984 and are described in (table 1).

Table 1. Alfalfa Yields in 1984 (hay equivalent, tons per acre)

1984 Fall Harvest Treatment	Potash (lb/ac)	Yield					1985 Spring
		1984				total	
		Cut 1	Cut 2	Cut 3	Cut 4		
4 wks after 3rd harvest	178	2.59	1.69	1.32	0.53	6.13	2.64
	625	2.68	1.76	1.46	0.69	6.59	2.94
6 wks after 3rd harvest	178	2.83	1.62	1.24	0.98	6.67	2.49
	625	2.54	1.58	1.31	0.92	6.35	2.41
Immediately after killing frost	178	2.27	1.67	1.39	0.95	6.28	3.10
	625	2.32	1.36	1.25	0.82	5.69	2.58

The fertility treatments were imposed to determine any interaction between potassium level and fall cutting treatments. Yields for the 4 harvests in 1984 and spring harvest in 1985 are shown in Table 1. Total yields from the 4 harvests in 1984 averaged 6.29 hay equivalent ton/acre. While yields of the 4th cut in 1984 were greater for a 6 week or after-frost harvest than for the 4 week fall regrowth period, total accumulative yields did not differ significantly because of some variability in measuring yields in the first 3 cuts. The data indicated no relationship between 1984 Fall harvest and the spring yields in 1985. The killing frost was quite late in 1984 (Nov. 1) and the winter was relatively mild with some snow cover. There was no interaction between k rate, harvest time with regards to spring harvest nor was there any measurable potassium fertilizer effects on yield. This is to be expected perhaps for the first few seasons since the site was purposefully chosen with a high potassium status.

These plots have been sampled bi-weekly to measure non-structural carbohydrate reserve levels, a physiological measure with plant vigor, and will be again monitored in 1986 for yield, winter survival and carbohydrate reserves.