

## Alfalfa Research Update - Fall Harvest Management

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How to manage alfalfa in the fall remains a topic for discussion by both farmers and educators. Many researchers have found that a nonharvest period of 4 to 6 weeks prior to the first killing frost is critical for alfalfa management in northern states. In Massachusetts this means the third harvest should be taken by mid-August, leaving sufficient time for recovery prior to a killing frost and winter dormancy. This relationship to fall management has been shown to be associated with the level of total nonstructural carbohydrates (TNC) in alfalfa roots and crowns. Root TNC provides energy for plant survival during the dormant season, early spring growth and regrowth after each harvest. Thus in a 4-cut system, in Massachusetts, it has been suggested that the fourth harvest only be taken after the killing frost.

Recent research suggested that it is the length of the regrowth period following the third harvest rather than the length of time prior to the killing frost which is critical to alfalfa winter survival and stand life. It has been suggested that if a 45 to 50 day regrowth period has occurred since the last harvest, a fall cut can safely be taken without the need for a further 4 to 6 week regrowth period prior to the killing frost. Our research in Massachusetts partly confirms this new recommendation. Taking the fourth harvest 6 weeks after the third harvest but before a killing frost had little or no adverse effects on alfalfa regrowth in spring for the first two years of such fall management compared to taking the fourth harvest after the killing frost (Figure 1). However, in the third growing season, there was more stand thinning, remaining plants were less vigorous and alfalfa yields were reduced compared to management under the old recommendation (Table 1). Compared to a 3-cut management system, yield for the 4-cut system was less in the spring and throughout the next season. After three years of fall management, 4-cut systems averaged 38.2% weeds compared to 7.6% in the 3-cut system (Figure 1, Table 2).

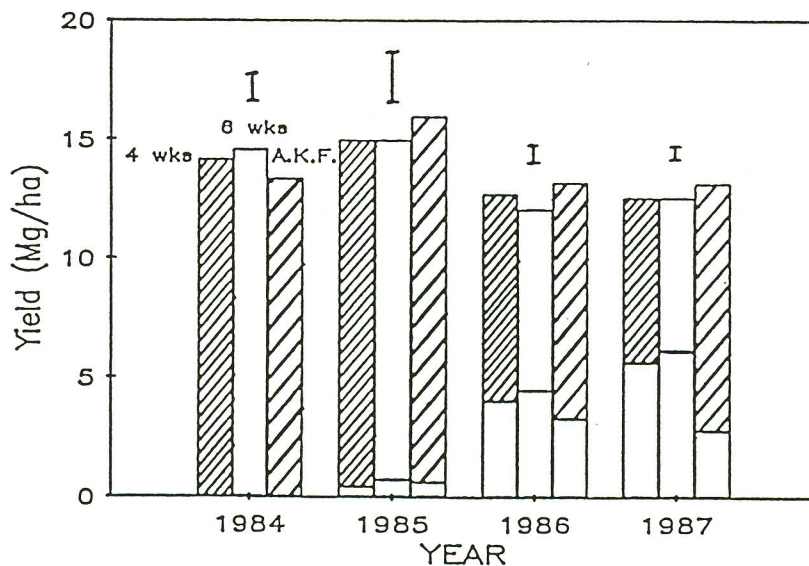


Figure 1. Total, alfalfa (upper bar) and weed (lower bar) yields of 4-cut system established in August 1983. L.S.D.'s for total yield are represented by error bars.

Table 1. Visual ratings for weed content, stand density and alfalfa vigor after 2 years' growth in spring 1986.

Autumn Mgt.	Visual Rating		
	Weed	Stand	Vigor
4 wks	3.9	3.0	3.0
6 wks	3.7	1.9	1.8
A.K.F.	1.9	3.5	3.6
L.S.D.	0.22	0.27	0.23

Weed: 1=<10%, 5=>50%; Stand: 1=sparse, 2=full; Vigor: 1=weak, 5=healthy.

Table 2. Forage yield and weed contribution to total yield in 1987 for alfalfa managed the first 2 years (1984 and 1985) as a 3-cut system.

Autumn Mgt.	Forage Yield		Weed
	Spr. 1987	Total	Content
	- - - Mg/ha	- - -	%
3 cut	7.6	14.1	15
46 days	6.3	12.1	19
A.K.F.	7.0	13.0	18
L.S.D.	1.07	1.23	ns

More income may be available by harvesting four times per year rather than three times. This will occur because more frequent timely cutting will increase forage quality. This increased forage quality will be translated into increased milk production. Stand duration of alfalfa will probably be shortened with a 4-cut system. Stand life may be one, two or three years in a 4-cut system compared to four or five years when only three harvests are taken. When stand density and vigor deteriorates and yield begins to fall away, rotating the field through a corn crop to capture nitrogen may be the best solution. Maintaining highly productive stands for just 3 years may be the realistic goal for many farmers. For other farmers, longer stand duration may lessen the frequency of stone picking.

When considering the last harvest of the season, if the decision is to maintain the alfalfa for another year, then a longer stubble needs to be left to collect protecting snow especially if no further growth is expected. Often the amount of forage available to be harvested after a killing frost may be hardly worth collecting.