

Late Summer and Fall Harvest Management of Alfalfa

Richard Leep¹, Jeffrey Andresen², Doo-Hong Min¹, and Aaron Pollyea²

Departments of Crop and Soil Sciences and Geography
Michigan State University

The difficult alfalfa harvesting conditions in the spring during first cutting causes many farmers to get off schedule for harvesting alfalfa.

This raises the question of best management for alfalfa harvest as the end of summer and fall approaches. Farmers have to balance the need for tonnage, forage quality and winter survival.

In the late summer and early fall, alfalfa must either be cut early enough so it can regrow and then replenish root carbohydrates and proteins or so late that the alfalfa does not regrow less than 8 inches and does not deplete root carbohydrates and proteins. This has resulted in the recommendation of a 'no-cut' window from September to killing frost in Michigan.

However, recent research in Quebec, Canada (1,2) has helped to redefine this window by assuming that if 500 growing degree days (GDD) accumulates after the last cutting there will still be enough regrowth of alfalfa for good carbohydrate accumulation in the crown and roots before a killing frost, and good winter survival and yield the following year.

So a producer can cut in September as long as there is enough warm weather remaining in the growing season (accumulation of 500 GDD) before a killing frost without hurting the stand. These GDD's are calculated as the average of the daily minimum and maximum temperatures above 41°F until a killing frost (25°F).

The Quebec

research also showed that cutting later in the fall was acceptable as long as there was less than 200 GDD's accumulated after cutting. When less than 200 GDD's are accumulated after a late fall cutting, there is little regrowth to use up valuable stored carbohydrates and proteins in the alfalfa crowns and roots. This would result in good winter survival of the alfalfa plants.

Using climatological statistics as a guide for the future in a given growing season, one can then calculate the sum of these two probabilities of reaching 500 GDD's after cutting in late summer or 200 GDD's after cutting in late fall to estimate the risk of winter injury or kill due to harvesting at different dates during this time period. These probabilities were calculated with 30 years of daily climatological data, 1971-2000 for 30 sites across Michigan. Graphs of the resulting daily probabilities of four selected geographical sites are listed alphabetically below. In each graph the top line of the graph represents the probability of accumulating either 500 GDD (dark green) or less than 200 GDD (light green) after the indicated date and shows the probability no injury or kill to alfalfa stands harvested on that date.

For example, the graph for Alma, Michigan indicates an 85% probability of reaching 500 GDD before a killing frost if cutting alfalfa on September 15 and a 20% probability of reaching 500 GDD if cutting on September 29. Waiting to cut until October 27 shows an 80% probability of reaching less than 200 GDD before a killing frost. In contrast, the graph indicates worst probabilities of achieving either condition at approximately the 3rd of October, which occurs outside of the traditional 'no-cut' period. In general, one can see a geographical shift of the center of the adjusted no-cut period from early in the September-October period in northern areas of the state (especially those in interior sections away from the lakes) to later in the period across southern sections. Probability graphs of several locations throughout the state can be found at the following websites: Michigan State University Forage Information Website <http://www.msue.msu.edu/fis/> by clicking on "New Fall Cutting Recommendations for Alfalfa, the Michigan Dairy Review Website <http://www.msu.edu/user/mdr/>, or the <http://www.agweather.geo.msu.edu/>

In summary, forage quality of alfalfa changes little during September, so harvesting versus delaying cutting should be based on likelihood of winter injury or survival if the stand is to be kept. The purpose of these graphs is to give a probability of winter survival at various cutting dates in the fall so that farmers can determine the risk associated

with harvesting at various dates.

Probability Graphs of Late-Summer GDD's

[Adrian](#)

[Alma](#)

[Alpena](#)

[Bad Axe](#)

[Battle Creek](#)

[Big Rapids](#)

[Cheboygan](#)

[Coldwater](#)

[Detroit](#)

[East Tawas](#)

[Gladwin](#)

[Grand Rapids](#)

[Grayling](#)

[Hart](#)

[Hesperia](#)

[Holland](#)

[Houghton](#)

[Iron Mountain](#)

[Jackson](#)

[Lake City](#)

[Lansing](#)

[Lapeer](#)

[Monroe](#)

[Muskegon](#)

[Saginaw](#)

[Sandusky](#)

[Sault Ste. Marie](#)

[South Haven](#)

[Stephenson](#)

[Traverse City](#)

References

1. Catherine Dhont, Yves Castonguay, Paul Nadeau, Gilles Bélanger, Raynald Drapeau, and François-P. Chalifour. 2004. Untimely Fall Harvest Affects Dry Matter Yield and Root Organic Reserves in Field-Grown Alfalfa. *Crop Sci.* 2004 44: 144-157.
2. G. Bélanger, T. Kunelius, D. McKenzie, Y. Papadopoulos, B. Thomas, K. McRae, S. Fillmore, and B. Christie. 1999. Fall cutting management affects yield and persistence of alfalfa in Atlantic Canada. *Can J Plant Sci* 79:57-63.