Late Summer Cutting Management of Alfalfa

Difficult alfalfa harvesting conditions sometimes result in farmers being off schedule for late summer harvesting alfalfa. This raises the question of best management for alfalfa harvest as the end of summer approaches.

Alfalfa must either be cut early enough in the fall to regrow and replenish root carbohydrates and proteins or so late that the alfalfa does not regrow or use any root carbohydrates if we want good winter survival and rapid greenup for good yield next. This has resulted in the recommendation of a ‘no-cut’ window from Sept 1 to killing frost for Wisconsin. However, research in Quebec has helped define this window by indicating that alfalfa needs 500 growing degree days (GDD, base 41°F accumulated until a killing frost of 25°F) after the last summer cutting to regrow sufficiently for good winter survival and yield the next year. This means we can cut as late as 500 GDD will still accumulate without hurting the winter survival which is usually September 1 or slightly later depending on location.

On the other extreme, we can also cut so late that little regrowth occurs. Calculating the 200 or less GDD level indicates when insufficient regrowth occurred to use up root carbohydrates. These plants would also have good winter survival. It is important to remember that we do not need to wait for a killing frost to take the last cutting. We must only wait until it is so cool that little or no regrowth will occur.

So we either want to take the last cutting early enough that regrowth and root replenishment occurs or so late that little to no growth occurs. Calculating the sum of these two probabilities tells us the risk of winter injury or kill due to harvesting at different dates during September. This data was calculated for eight sites in Wisconsin where we had 30 years of weather history. In each graph, the area with diagonal lines is the probability of accumulating 500 GDD after each week. The purple area with ‘+’s in it is the probability of accumulating less than 200 GDD. So the top line is the probability of accumulating either 500 GDD or less than 200 GDD after the indicated date and shows the probability no injury or kill to alfalfa stands harvested on that date. We should assume that the graphs are for very winterhardy varieties (winter survival score of 2 or less) and that less winterhardy varieties would be at more risk. Optimum soil test levels of soil pH (6.5 or higher) and potassium can also enhance winter survival.

We can see that, at Lancaster and Beloit, 94 and 100 percent of the time we have accumulated 500 GDD or more after September 08. Waiting one more week reduced the probability to 61 and 87%, respectively. Thus great risk is not incurred until cutting two weeks after September 1.

At Eau Claire, Hancock and Marshfield, 94, 94 and 91 % of the time 500 GDD was accumulated after Sept 1, respectively. Probability of 500 GDD accumulation fell to about 70% one week later. Thus, not harvesting after Sept 1 is the safe alternative but oftentimes being a week late was not detrimental. We also see that harvesting at the end of September, 6 to 16% of the time we had less than 200 GDD accumulation. Waiting till mid Oct will often be safe whether or not a frost has occurred.

At Plymouth, we had 100% probability of 500 GDD following a Sept 1 harvest and the potential for 500 GDD fell rapidly after that date.

At Antigo and Rhinelander the probability of 500 GDD after Sept 1 was 61 and 84%, respectively. After Sept 21 the likelihood of accumulating less than 200 GDD increased significantly indicating that a cutting could likely be taken at the end of September with good probability of no regrowth and good winter survival.

We should remember that forage quality of alfalfa changes little during September, so harvesting versus delaying harvest should be based on likelihood of winter injury or survival if the stand is to be kept. The effect of timing late summer cuttings on winter survival and next year yield depends on the weather following cutting. These charts 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.

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