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Time Alfalfa Harvest for Optimum Quality

The first cutting represents up to 40% of the total alfalfa yield for the year. It is critical for growers to harvest first cutting at the optimum stage of growth. Optimum alfalfa quality is reached when the neutral detergent fiber (NDF) concentration reaches 40%. Delaying harvest beyond the optimum stage of growth for high quality results in forages that are lower in nutritional content and more difficult for animals to digest.

Methods of Predicting NDF

Methods that can help predict the optimum time to harvest alfalfa based on NDF include the Scissors Cut Method, the Predictive Equation for Alfalfa Quality developed at the University of Wisconsin, and the Growing Degree Days Method (GDD, base 41° F).

Scissors Cut Method

Scissors cut samples provide a direct measurement of NDF. Sampling technique is critical. A representative sample must be obtained from across the field. Shipping samples to the laboratory for next-day delivery will help to minimize deterioration in sample quality.

Predictive Equation for Alfalfa Quality (PEAQ)

The PEAQ method uses the length of the tallest alfalfa stem and the stage of the most mature alfalfa plant in the area sampled to predict NDF. It is important to obtain NDF estimates at five or more locations across the field to ensure reliable results.

As with GDD, the PEAQ method was developed for pure stands of alfalfa only. NDF estimates from PEAQ will not account for weeds or grasses in the stands. PEAQ is not reliable for estimating NDF when alfalfa is very short (longest stem less than 16 inches) or very tall (longest stem more than 40 inches).

Growing Degree Days (GDD)

The GDD method for alfalfa is based on the average daily temperature beginning on March 1 and using a base of 41° F. The daily calculation is: $((\text{high temp} + \text{low temp}) / 2) - 41$. The total GDD is the sum of the positive daily GDD values since March 1.

It takes about 430 GGD for alfalfa to reach 30% NDF, about 600 GGD to reach 35% NDF, about 750 GGD to reach 40% NDF, and about 970 GDD to reach 45% NDF.

GDD predictions of NDF concentration only apply to pure alfalfa stands. Grass matures earlier than alfalfa and significant amounts of grass in alfalfa fields will increase NDF concentrations in the harvested forage.

Predicting NDF concentration using GDD cannot be done when there is inadequate soil moisture because GDD accumulate with little or no response in plant growth. Therefore, the GDD method is only recommended for first cutting alfalfa.

Which Method Should I Use ?

In 2000, MSU researchers compared these alfalfa NDF prediction methods in 35 locations throughout Michigan, including 5 locations in the Upper Peninsula.

Based on the results of this project and previous research, we recommend the following:

- The GDD and PEAQ methods should not be used for fields containing grass and / or weeds. Use only the Scissors Cut method for these fields.
- Use Scissors Cut, PEAQ or GDD to predict NDF for first cuttings of pure alfalfa stands.
- Use only the Scissors Cut or PEAQ methods to predict NDF for second cuttings of pure alfalfa stands.
- Use only the Scissors Cut method to predict NDF for third, fourth or fifth cuttings of pure alfalfa stands.
- If your goal is 40% NDF, then cutting should begin before the standing crop reaches 40% NDF. Changes in quality due to wilting, harvesting, and storage may further raise the NDF content by 2 to 6 units. Therefore, begin cutting alfalfa at 38% NDF (675 to 700 GGD, base 41° F for first cutting).

Sources:

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