

Using “Scissors Cutting” To Optimize Forage Quality

Joel Bagg, Forage Specialist, OMAFRA

The weather in eastern Canada the spring of 2012 created a unique situation for forage development. Alfalfa broke dormancy in early-March and responded to warm temperatures with significant growth. This was followed by severe frosts in late-March that froze growing points and forced plants to regrow from new axillary and crown buds. Cool and dry April weather delayed recovery and growth. Additional severe frosts hit some areas in late-April. Forage development and maturity are all over the map! How will this affect forage quality and when should we start cutting 1st-cut haylage?

High quality forage is essential to dairy farm profitability. The benchmark for “high producing dairy cow” quality alfalfa haylage is considered to be 20% Crude Protein (CP), 30% Acid Detergent Fiber (ADF), and 40% Neutral Detergent Fiber (NDF).

Determining Optimum Quality

Optimum alfalfa NDF for intake and dietary fiber is about 40%. This is considered a good balance between the conflicting goals of maximizing intake, digestible energy, protein utilization, adequate dietary fibre (rumen function) and yield per acre. Ideally, the haylage should be 40% NDF at about the mid-point of the harvest. With warm weather, NDF can increase more than 0.7 units per day and fiber digestibility (NDFD) can decrease more than 0.5 units per day, so quality drops rapidly. Alfalfa yield per acre at this stage can increase 100 lbs of dry matter per day, but it comes at the expense of nutrient quality. Cutting too early also stresses the stand.

It is always preferable to be too early rather than too late. If we cut too early, we sacrifice some yield and stress the alfalfa stand, but we can always add necessary dietary fibre by adding some straw to the total mixed ration. When we cut too late, it is difficult to compensate by adding energy and protein to the grain portion of the ration. Intakes often suffer and it is more difficult to get the cows to milk like they should. Of course, finding a window of dry weather can complicate things even further, and we often have rain delays as maturity increases.

In mixed stands, be sure to consider the maturity of the grasses when making cutting decisions. Grasses have higher NDF, but also higher NDFD levels than alfalfa. Forage quality of grasses declines faster with maturity than alfalfa. Grasses fed to high producing dairy cows should have NDF less than 55%, with 50% being ideal. A late break in alfalfa dormancy and cool spring weather often results in mixed stands that have a greater proportion of grass, and also grass that is relatively more mature than the alfalfa.

Targeting 40% NDF Alfalfa

Research has shown that NDF can vary from one year to the next by up to 10 percentage units when cutting is on the same date. The relationship between morphological stage (such as early- or late-bud stage) and NDF is not always as high as we might think. Cool, wet conditions can delay the onset of bud stage while NDF continues to increase. In a

Cornell study, NDF sometimes reached 40% before any buds were visible, while in other cases buds were visible up to 2 weeks before alfalfa reached 40% NDF. Also, some forage quality is always lost with harvest and storage, so we want to target a lower NDF level in the field than what we want in our haylage.

Decision Making Tools

When to begin cutting is always a difficult decision. Some decision making tools are better than others. Methods used to determine when to cut include:

- morphological stage of development (ie late-bud, etc.),
- Growing Degree Days (GDD) (minimum and maximum daily temperature accumulations),
- Predictive Equations for Alfalfa Quality (PEAQ), and
- “Scissors Cut” sampling and rapid lab analysis.

Growing Degree Days

GDD (base 5°C) models using daily maximum and minimum temperature data to predict NDF levels has had limitations in Ontario. Most models target 40% NDF at 390 GDD (700 GGD base 40°F) or less. “Computer geeks” like it because you don’t have to bother going to the field and looking at the crop, but it can be inconsistent. GDD models will be especially challenged this year with early breaks in dormancy and multiple setbacks from frost damage.

Predictive Equations for Alfalfa Quality (PEAQ)

PEAQ uses the longest stem and the most mature stem in a (2 X 2 ft area) standing crop of alfalfa to estimate the NDF. It combines using the morphological stage (ie. bud, flower) with plant height. “PEAQ sticks” are available (or can be homemade) to be used in field. In “almost pure stands” of alfalfa under typical growth conditions, it can be remarkably accurate. It has the added advantage of requiring you to be standing in the crop. (www.omafra.gov.on.ca/english/crops/facts/info_ndf.htm)

Scissors-Cut Sampling & Analysis

Samples are taken once or twice a week (Monday to Thursday) in the morning at a normal cutting height. Multiple samples are “grabbed” at random at various places in a field to get a representative sample. Avoid field edges and smaller damaged areas. Samples should be about 0.5 lbs (225 g). Remove excess moisture from the sample with a towel and place in a paper bag. Deliver to the lab with overnight express delivery. Labs typically use near infrared reflectance spectroscopy (NIRS) and they should be calibrated to accurately do this with fresh samples. The following Ontario labs offer scissors-cutting analysis:

- Agri-Food Laboratories www.agtest.com
- A & L Canada Laboratories www.alcanada.com/Agricultural-Feed.htm
- Stratford Agri Analysis www.stratfordagri.ca.

Results should be available from the lab by fax or e-mail the following day. Courier and lab costs are cheap relative to feed bills.

Sharing the Data

The balance of yield versus quality versus persistence is always an issue in forage harvest management. None of these tools are perfect. Scissors cut data for an individual farm can be useful. A cooperative approach could also help. Posting and sharing data on a website may give us a more accurate method of monitoring the progression of forage quality in the fields in our area. Send me your data (joel.bagg@ontario.ca) and we'll try to make that happen next year!