

When to Harvest Alfalfa/Grass Stands

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Spring forage harvest is the most crucial of the year, and sets the stage for good harvest management the rest of the season. A forage crop is defined as a crop that can meet the effective fiber needs of a cow when fed as the primary forage source in the diet. Forage grasses and legumes are needed to optimize the fiber content (NDF) for the class of livestock being fed, therefore, NDF is the most useful harvest date target. There is a relatively small range in optimal NDF for lactating dairy cows, making correct harvest management decisions relative to quality critical. A reliable method to estimate the fiber content of grass and alfalfa-grass mixtures would help producers in timing harvesting operations to optimize the quality of the harvested forage. Once the forage is harvested and stored, an accurate forage quality analysis is needed prior to ration balancing.

For pure alfalfa stands, researchers have developed a number of methods to estimate NDF. The most widely used method is predictive equations for alfalfa quality (PEAQ), developed in Wisconsin. The PEAQ equations have limited practical value in many parts of the Northeast where stands of alfalfa often include perennial grasses. For example, in New York more than 80% of stands are mixed alfalfa-grass.

Predicting Mixed Stands

A study was undertaken at Cornell to develop a system for estimating alfalfa-grass NDF in the field prior to harvest. The study sampled mixed stands at 2 experimental sites and 150 producers' fields in 19 New York counties during May and June 2004 and 2005. Stands were sampled when alfalfa reached or exceeded 12 inches and a range of plant measurements and environmental characteristics were recorded.

The most significant outcomes from this research include:

1. The NDF content of alfalfa can be estimated in the presence of some grass. The PEAQ equation for pure alfalfa NDF was found to work for the alfalfa component of mixed stands. Even though grass affects alfalfa height, which is the most important variable in the PEAQ equation, the relationship between alfalfa height and NDF remains consistent.
2. Equations were developed for estimating mixed-stand NDF using a combination of environmental measurements and sward characteristics.

Researchers found a range of plant measurements and climatic variables useful in predicting mixed-stand NDF. But in selecting a model for practical use, variables were concentrated on the basis that both increased the predictive accuracy of the equation and were easy to measure. These variables were percent grass, which is essential in setting a target harvest NDF, and alfalfa height, which is simple to measure.

Percent grass. The target NDF at harvest for pure alfalfa silage is ~38% for pure alfalfa and 50% for pure grass, assuming a 10-15% decline in forage quality due to harvest, storage and feedout.

For alfalfa-grass mixtures, the target harvest NDF is a function of the percent grass in the stand. Figure 1 shows the target harvest NDF for stands with an increasing percentage of grass. If a different target NDF is preferred for either pure alfalfa and/or pure grass, this system can easily adapt to changes.

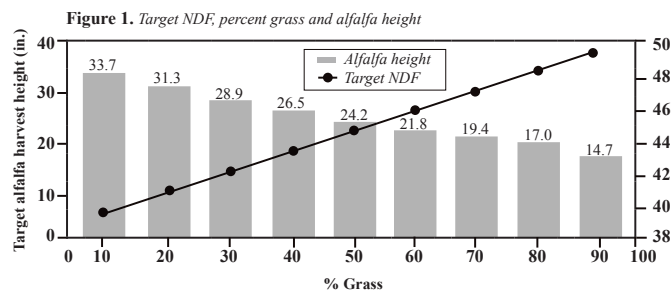
Alfalfa height. Once a grass percentage and target NDF is set, target alfalfa height can easily be determined. The bars in Figure 1 show the target alfalfa harvest height for mixed stands with 10-90% grass. For example, if it is determined that the field is 50% grass, then the target NDF is 44, and the target harvest height 24.2". It should be noted that as the percent of grass increases, the target NDF increases and the target alfalfa height decreases.

Tips for Success

The following procedure will help determine the optimum date to harvest mixed alfalfa-grass forage:



NDF content of alfalfa can be estimated in the presence of some grass. ☘



1. Examine 3-5 locations in the field so the percent grass and alfalfa height values are representative of the whole field.
2. The most important, and difficult, part of setting the harvest target is estimating the proportion of grass in the stand. There is a tendency to underestimate the proportion of grass; accurate estimation takes practice. Estimates can be 'calibrated' by selecting a small area, estimating the percent grass and cutting a representative part of the selected area. Separate the sample into alfalfa and grass and weigh to determine the approximate percent grass, which can be compared with the estimate.
3. Measure alfalfa height by selecting an area approximately 2 ft². In that area, locate and straighten the tallest alfalfa stem. Measure from the soil surface to the tip of the stem, not to the tip of the tallest leaf.

To find more information on managing alfalfa-grass stands click the tools tab at www.forages.org.