Harvest Timing for Alfalfa/Grass Mixes

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The first harvest of hay crops (alfalfa and grasses) typically has the highest yield and quality. Thus, it is important to optimize forage quality according to your needs. Harvest timing depends on several factors, including forage quality, inventory needs, weather, and stand/field conditions. To estimate alfalfa forage quality as harvest approaches, we often use predictive equations for alfalfa quality (PEAQ) developed by UW researchers (fyi.extension.wisc.edu/forage/files/2014/01/PEAQTable.pdf), or send in scissors clip samples to a forage lab. For lactating dairy cows, we often target first harvest of pure grass stands at late boot stage, before heads emerge, to balance quality and yield. For first harvest of alfalfa/grass mixes, forage quality declines rapidly as plants mature, so having an estimated target date helps in harvest planning. With more dairy farms including grass in rotations, often mixed with alfalfa, target harvest date becomes difficult to estimate due to the need to balance quality of the alfalfa and grass. Oftentimes, alfalfa is immature or low-yielding at a point when grass has ideal forage quality. Target harvest quality for alfalfa/grass mixes depends on alfalfa and grass proportions using neutral detergent fiber (NDF) as a harvest timing indicator. Target NDF% for a pure alfalfa stand is typically 35-40%, while target NDF% for a pure grass stand is ~50%. Fields with a higher alfalfa proportion should be harvested depending on alfalfa maturity/height and have a lower NDF target (40-42%), often harvesting when alfalfa is taller/more mature. However, fields dominated by grasses will have a higher NDF target (46-48%) and should be harvested according to grass maturity and fiber content, often harvesting when alfalfa is shorter/less mature.

The process of deciding when to harvest should begin well before the anticipated harvest date to allow for good planning and coordination. To assist in this process, a tool (Alfalfa-grass NDF Estimation) was developed by Cornell University researchers helping to determine a target harvest date depending on the target NDF content (forages.org/index.php/tools-grassman). The tool estimates current NDF% based on height of the tallest alfalfa stems and percent of grass in the stand, and then determines a harvest date based on the target NDF% and the daily change in NDF content (assumption based on anticipated weather). Target NDF depends on the percentage of grass in the mixture with a calculated target for feeding to lactating cows or young heifers. You also can enter your own target depending on the animal class to be fed. A higher NDF goal would be suggested for dry cows and pregnant heifers. Measurements of alfalfa stem height and percent grass should be taken from 3-5 representative field locations. Percent grass is difficult to estimate at first and takes practice. To do so, clip a few representative areas, separate grass and alfalfa, and weigh each to determine the percent of each in the mixture. The portion of grass is typically underestimated and will affect the target NDF, estimated NDF, and harvest timing. An example scenario would be a stand with 50% grass and tallest alfalfa stem height average of 20". Based on these inputs, the tool estimates the stand is currently 40.5% NDF with a target NDF of 44%. Using the normal assumed maturation rate, the stand would be ready to cut in 4-5 days with the alfalfa being 24.5" tall. Under warmer conditions, the stand would be ready to harvest in 3-4 days, while cool conditions would slow maturation with harvest in 5-6 days. The tool can also help make decisions on subsequent harvests to meet specific NDF targets for different animal groups.

Harvest management (cutting height, swath width) plays a critical role in forage quality and regrowth potential, especially in grasses. They use energy reserves stored in the stem base. Therefore, regrowth can be dramatically slowed if cut low, as is often the case with alfalfa when using a disc mower. If the stand is predominantly alfalfa, do not cut lower than 2" in order to help keep grass in the mixture. If the mixture is high in grass content, cut at 3" to avoid damaging grass and encourage fast regrowth. A higher cutting height also reduces ash contamination occurring with low stubble height. Swath width is also critical to enhance drying and reduce plant respiration losses prior to harvest. A swath width ≥80% of the original cut width will speed drying when looking to cut and harvest silage the same day.

Alfalfa-grass forage mixes can be higher quality (high protein/fiber digestibility) than pure stands of either when managed to optimize overall mix quality. Use of the harvest target date tool helps in this process to plan anticipated harvest dates based on NDF content using in-field data. We can't always predict weather, but we can better plan around it to meet forage needs.

References:

Parsons, D., D. Cherney, J. Cherney. 2011. Grass Information Sheet 22: Predicting spring fiber content of forages. Grass Information Sheet Series. Cornell University Cooperative Extension. (http://www.forages.org/files/gis/GIS22_Predicting_Spring_Fiber_Content_of_Forages.pdf)