GUEST COLUMN

Top Harvest Tips for Better Forages

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It seems to be a never-ending battle – farmers work with their agronomists to put up quality forage but the nutritionist always finds a fault. The solution? Measurable quality targets everyone agrees on ahead of time.

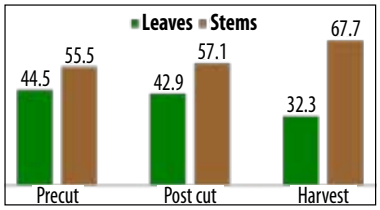
Do you know what your forage quality target is?

The "big picture" – the nutritionist wants to build a profitable ration and keep cows healthy and set individual forage goals based on the role each plays in the total mixed ration (TMR). Targets include forage quality, length of cut, moisture, and degree of processing. Each farm will have different harvest targets for each forage.

If Hay/Haylage is the Primary Forage in the Ration

1. Harvest maturity.
   - For first cut, use a PEAQ or PAY stick and test multiple field locations. This is a quick and easy way to check a large field and assess variation throughout. Start harvest when the stick reads 20 points higher than your target RFV.
   - For second + cuts, choose a harvest interval and stay as close to it as the weather allows. Intense heat will reduce neutral detergent fiber digestibility (NDFD) at a given maturity, and drought will reduce yield. Manage it the best you can.
2. Reduce risk of rain damage. Dry quick, harvest fast. Lay out a wide-swath (swath 80% of the cutterbar width or wider and spread evenly) to speed drying.
3. Cutting and chopping.
   - Mow after the dew is off, only cut what you can chop within 24 hours.
   - Leaves exposed to sunlight will continue to make sugars and transpire moisture until they get <60% moisture.
   - If internal windrow moisture is >60% at night, plants will continue to respire/burn up sugars.
   - Chopping hay too dry can result in added leaf loss.
4. Preserve leaves. Research from CROPLAN By Winfield United has shown ~22% leaf loss between cutting and arrival at the silo. Leaves are the highest quality part of the plant with an RFQ >400.
   - Don't over-condition. If using a flail-type conditioner for alfalfa, set to the low-speed setting and raise the rear deck lid to condition less aggressively and save leaves. For roll-type, open the rolls a bit. The thinner you spread the swath, the less conditioning is needed for haylage. Hay still needs normal conditioning to dry the quickest.
   - Run the discs only fast enough to avoid leaving streaks. This creates less turbulence inside the mower to reduce crop abuse and added dirt.
   - Handle the crop when it is still "durable" (wetter).
     - If tedding, do it within 2 hours of mowing or when there is still dew on the crop.
     - Merging/raking. Don't wait until it is dry enough to chop; start ahead of the chopper and let it finish drying in the windrow.
     - Raking/merging/chopping. If you see leaves flying, you are too late. Consider stopping and starting again after there is dew on the crop.
     - Leaf loss is not only a quality loss, it's a yield loss. On an average crop, a 10% leaf loss is about ¼ ton of yield.

Figure 1. Leaf content at harvesting stages.

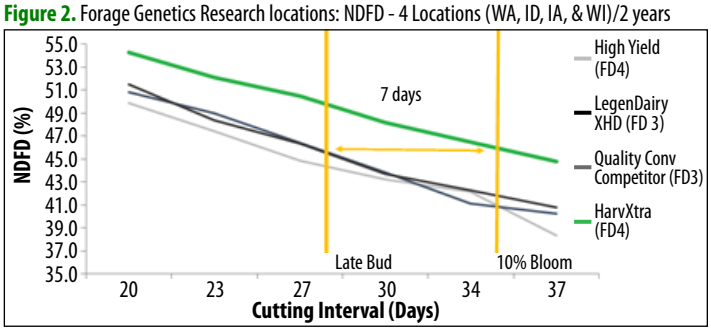


WI farm data collected from WinField United associates in partnership with Dan Undersander UW-Madison, 2016.

5. Don't add dirt. Alfalfa naturally contains ~8% ash (mineral) on a dry matter (DM) basis but many haylage samples test >12% ash. The difference is usually added dirt (soil particles). For every 2 percentage units of ash added, RFQ drops ~5 points. This lowers nutrient content and makes it more difficult to reach a stable pH during fermentation. Stay <10% ash!
   - Cut at 2.5-3"cutting height. Keep forage off the ground.
   - Don't gouge the soil. Set discs to be as level as possible, allowing the mower to float so you don't drive disks into the dirt.
   - Use steep angle knives (~14-18° "twist") for first cutting or where you expect lodged material. Switch to shallow angle knives (~7° "twist") for second + cuts. Shallower angled blades will vacuum up less dirt into your forage when stands aren't as heavy or there is more exposed soil.
   - Equipment. Research at the University of Minnesota shows that when properly set up, rotary rakes add no more ash to forage than mergers. Both add less dirt than wheel rakes where the tines must touch the ground to turn.
6. Use technology to widen your options. The HarvXtra® alfalfa trait blocks the production of specific types of lignin as the plant grows, resulting in a higher NDFD throughout the season.
   - This trait widens the harvest window, allowing more flexibility.

- University of Minnesota research, as well as other field results, show HarvXtra® alfalfa can be harvested ~7 days after non-HarvXtra® alfalfas to obtain similar RFQ values.
- A delayed harvest option provides longer regrowth periods, increased yield, and potential to eliminate one cutting to better maximize the growing season. Another option is to maintain your current harvest schedule for increased quality (higher NDFD) potential.
- Nutritionally, feeding HarvXtra® alfalfa and BMR corn silage together can be an excellent combination. Either normal or delayed harvest options of HarvXtra® alfalfa fed along with BMR corn silage can provide high fiber digestibilities, greater forage intake, more energy from forage and higher proportions of forage in the ration. This potentially lowers purchased feed costs and can benefit animal health.

Figure 2. Forage Genetics Research locations: NDFD - 4 Locations (WA, ID, IA, & WI)/2 years



If Corn Silage is the Primary Forage in the Ration

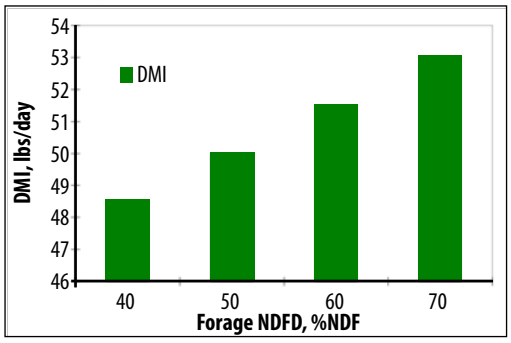
1. Select the right hybrids and right maturities.
   - With stay-green or late-season vigor, stalks often stay wet well past the optimal silage kernel moisture. Drier kernels have lower initial starch digestibility. Harvest these as early as possible and feed last to help soften kernels.
   - Different hybrids may dry down differently and have varying levels of fiber and/or starch digestibility. Quality can vary with the growing season. From a dairy nutritionist's view, BMR hybrids consistently have high NDFD and starch digestibility every season.
   - Should you consider chopping higher? Raising the cutting height leaves the wettest part of the crop in the field, allowing you to start chopping earlier – hopefully, when the kernel milk line is right. Some yield will be lost as a result.
2. Start harvest a little wet. For bunk silos, start harvesting when whole-plant moisture hits 70%, if possible. Goal is ½-⅔ milk line when the whole plant is ready to chop. As the plant dries down, it loses digestible neutral detergent fiber (NDF) while indigestible NDF increases as a proportion of NDF (Owens, 2008. FL Rum Nutr Symp).

3. Kernel processing.
   - Drier kernels and longer lengths of cut need to be processed more aggressively. Starch digestibility will be lower in drier kernels, so grind them finer. Aggressively processing stalks and cobs breaks them up more to reduce sorting and promote higher packing densities in the silo.
   - Some ½ kernels in the silage may be ok if they still have a milk line and the starch is pasty when rubbed between your fingers. Kernels that are only cracked or nicked are NOT acceptable.

All Forages

1. The nutritionist cannot replace NDFD of forage.
   - Why is forage quality important?
     - Digestible forage breaks down and clears the rumen rapidly, allowing greater dry matter intake (DMI) and total nutrient intake as NDFD increases.
2. Length of cut. Shake out your TMR and all forages with a Penn State Shaker Box.
   - The TMR target is 8-12% material on the top screen and <50% in the pan (use 2 screens + pan). If the shakeout of the TMR is light on top screen, check forage shakeouts and measure longer pieces. Then, set length of chop longer than those measurements.
   - Lengthening haylage may be most effective if you can still get it to pack.
   - If there is top screen material in any of the shakeouts that could be easily sorted, then length of cut should be shortened or processing should be increased.

Figure 3. The relationship between forage NDFD content and DMI in lactating dairy cows.



Data – Oba and Allen, 1999. JDS 82:589-596, Graph from Hoffman & Combs, 2004. Focus on Forage V6, No.3.

3. Match the quality to your ration.
   - Target a quality level matching each forage's role in the TMR.
   - High corn silage rations get energy from corn silage; therefore, the haylage may need to be higher in NDF and cut longer to meet fiber and top screen targets.
   - High haylage rations need a haylage higher in digestibility than what is needed in a high corn silage ration.

The big picture – if you want above-average milk production, you need above average forage quality.