

TECHNICAL TOPICS

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HARVESTING HAYLAGE: A TRICKY ENDEAVOR AND CONSIDERATIONS FOR THE FUTURE

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KEY TAKEAWAYS

- High quality haylage can reduce out of pocket feed cost
- Use a PEAQ stick and growth stage of plant to help monitor when to cut your haylage
- Quick dry down after cutting haylage is the best way to preserve important carbohydrates in the plant
- Consider alternative forages or western hay to replace inconsistent haylage quality on your farm



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HARVESTING HAYLAGE

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WHY IS QUALITY HAYLAGE IMPORTANT?

Winter is finally loosening its grip and sunny, warm weather is approaching quickly. Many dairy producers should start to think about how they will harvest quality haylage for the year. The last few winter seasons followed by wet springs has made it difficult to harvest high quality haylage and keep up with haylage inventory, making haylage a high priced forage. Since haylage is expensive and you need it for milk production, it is important to harvest haylage high in protein, sugars, and digestibility.

High quality haylage allows you to remove some out of pocket feed expenses from your ration. For example, we can compare haylage quality by using the relative feed quality (RFQ) and the amount of crude protein (CP) of the haylage. If a dairy producer had haylage at 21% CP with low RFQ at 135, they would have to feed approximately an extra pound of soybean meal in order to achieve the same amount of milk as a producer that had a higher quality haylage at 22% CP and 180 RFQ, according to ration balancing with Cornell Net Carbohydrate and Protein System (CNCPS). The producer with the lower quality haylage would have a higher out of pocket feed cost of about 16 cents per cow per day to feed the extra soybean meal. This cost can add up very quickly and so it makes a huge difference if

if you can improve the protein content and RFQ of your haylage!

Keep in mind that harvesting high quality haylage yields less tons per acre as you need to harvest the plant when it is younger and not as tall. Producers need to consider what their haylage needs are for the dairy as a whole. If they need inventory to feed dry cows and heifers, then that can be a lower quality haylage that yields more per acre as those animals are not producing milk and won't need as much commodity supplementation to meet their nutritional needs. In addition, yield on each haylage crop, i.e. first cutting, second cutting, etc., will vary so the dairy producer should think about which crop will feed which group of animals. Generally first cutting hay has the lowest protein due to growing in the wet spring weather and can be used to feed dry cows and heifers. It can also be a good base for a milk cow ration to balance out the higher digestible subsequent hay cuttings.

WHEN SHOULD YOU HARVEST HAYLAGE AND WHAT SHOULD YOU DO?

Once you know what your haylage needs are, then you can determine the timing of harvest for each crop of haylage. The general rule of thumb for haylage is to harvest every 28 days after the first cutting. As we've experienced the last couple years, it can be hard to harvest every 28 days due to inconsistent weather patterns. I would use the 28 day interval as an estimate of when the next cutting might be and in addition go out and scout the field and cut based on plant growth stage and maturity. See the image on the left for plant growth stages. You will get the highest quality forage by cutting before flowering at the bud and vegetative state. The plant growth stage and maturity can change quickly due to the weather. If it's hot and sunny the plant will mature quickly and maybe not grow as tall. If wet and cool the plant will mature and grow slower.



Vegetative
growth stages 0-2



Bud
growth stages 3-4



Flower
growth stages 5-6

Producers can use a PEAQ stick (Predictive Equation for Alfalfa Quality) or height and stage of growth to determine the forage quality. The table to the right includes using the relative feed value (RFV) of the forage determined by its height and stage of growth. Keep in mind that the forage usually loses 20 points of RFV from the time of harvest to placing in storage. This means if you are aiming for an RFV of 150 you should cut the alfalfa when it is predicted to be 170 RFV standing.

Not only is it important to know when to cut for quality, but also when to cut for higher carbohydrate content and a quick dry down. Sugars are the main source of carbohydrates in alfalfa. Research has confirmed that alfalfa has higher carbohydrate content in the afternoon because carbohydrates accumulate during daylight hours and are produced faster than the plant can translocate them to the root or crown. Concentrations of carbohydrates reach a peak in the late afternoon.

Stage of Most Mature Stem

Height of Tallest Stem From soil surface to stem tip	Late Vegetative No buds visible	Bud Stage One or more nodes with visible buds; no flowers visible.	Flower Stage One or more nodes with open flower(s)
Inches	RFV	RFV	RFV
16	237	225	210
17	230	218	204
18	224	212	198
19	217	207	193
20	211	201	188
21	205	196	183
22	200	190	178
23	195	185	174
24	190	181	170
25	185	176	166
26	180	172	162
27	175	168	158
28	171	164	154
29	167	160	151
30	163	156	147
31	159	152	144
32	155	149	140
33	152	145	137
34	148	142	136
35	145	139	131
36	142	136	128
37	138	133	126
38	135	130	123
39	132	127	121
40	129	124	118
41	127	122	115
42	124	119	113

LOW-LIGNIN ALFALFA

To help create high quality haylage, products like low-lignin alfalfa (also phrased as reduced-lignin alfalfa) can be used. Low-lignin alfalfa reduces lignin content in the plant by 7 to 18% depending on the product planted (i.e. HarvXtra or Hi-Gest 360). Lignin makes up an indigestible, fibrous portion of the plant, providing the strength necessary to stand upright. The more lignin in the plant, the less digestible it is. There are multiple advantages to using low-lignin alfalfa. One is that you can continue to harvest as you normally would and achieve a higher digestible crop. Another is that you can extend your harvest window. Extending the harvest window allows you to achieve a quality crop even if weather should slow you down. A longer harvest window can also extend the stand life of your alfalfa by reducing the amount of cuts you take per year. Since weather is so unpredictable, your greatest advantage to low-lignin alfalfa is extending your harvest window so that you can still acquire a quality alfalfa even though it may have been in the field longer than you would've liked. You can view this as a kind of insurance policy on your haylage quality and it may save you during years that weather is bad!

Continued from page 3...

Once the plant is cut, it continues respiration and uses up the carbohydrates until moisture in the plant reaches 50%. In western, arid regions late afternoon cutting can work as low humidity and sunshine will dry the plant down quickly and preserve carbohydrate content. In the high humidity of the Midwest, it is usually not possible to cut the plant in the late afternoon and get a quick enough dry down. In order to best preserve carbohydrate content in the Midwest, cut in the morning on a sunny day and get rapid dry down of the plant during daylight hours. To get the most effective rapid dry down you will want to have a wide swath. You should have a swath that covers at least 60% of the cut area for the best dry down.

WHAT CAN YOU CONSIDER FOR THE FUTURE IF YOU HAVE LOW OR INCONSISTENT HAYLAGE INVENTORY?

Due to the inconsistencies and frustrations of harvesting haylage and having weather such a high influencer of the quality, you could consider moving away from haylage to bring in a more consistent forage. Buying dry hay from western states is reliably consistent in quality and can replace inconsistent haylage yield and quality. In addition, some may consider planting BMR forage sorghum to feed a ration that is high in corn silage and low in hay. The BMR characteristic will bring the quality of high digestible fiber and work to maintain the amount of fermentable starches in the total ration at a safe enough level to prevent rumen acidosis or hemorrhagic bowel syndrome. If you choose to feed dry western hay, make sure it gets cut to 2-3 inches when feeding it in a total mixed ration. This prevents the cows from sorting the ration.

In summary, there is a lot to think about in planning for your future forage inventory. High quality haylage is probably still the best out-of-pocket money saver since you can feed less commodities to make the same amount of milk. Quick dry down of haylage after it is cut is the best way to preserve the nutritional content. It's always good to think about what options are available for future milking rations should you run low on haylage inventory and quality. Consult your nutritionist on exploring the best options for your dairy's situation.

References are available upon request.

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