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WHAT CAN FARMERS DO WITH WET HAY? Eugene Rodberg, Product Manager, Kemin Industries

In certain areas of the Upper Midwest, the cold, wet spring ruined the best laid plans for harvesting an alfalfa crop. We have all learned to deal with weather when handling growing crops – and with alfalfa on the ground, we must do something. Our Midwestern University and Extension teams do an excellent job of providing timely advice and have excellent websites farmers can access for help. But, in general, what can farmers do to help manage the alfalfa crop and still retain most of the nutritional value?

Preservatives for baled hay:

There are many preservative and desiccant products on the market to help manage hay baled at higher-than-ideal moisture. The biggest concern with packing moist hay into bales is the heating and spoilage which can occur because of mold and wild yeast growth. Two products which have shown some efficacy in controlling heating and spoilage of baled hays are desiccants and acid preservatives.

Desiccants and organic acid preservatives work in very different ways with different modes of action. Desiccants are compounds applied to the hay at cutting to increase drying rate. They work by breaking down the waxy coating on the legume or alfalfa stem and allow the plant to dry faster. Acid preservatives are applied to hay as it is baled to allow baling of wetter-than-normal hay without spoilage during storage. Organic acids work by impacting the growth and reproduction of mold and wild yeast, thus preventing growth of these spoilage organisms. Both products are usually applied through a spray system, either on the mower (for desiccants) or on the harvesting equipment (for acid preservatives)¹.



Days to dry down alfalfa in the Midwest can be few and far between, but, when wet conditions threaten cut alfalfa, careful management can help farmers provide a quality product.

The University of Wisconsin has an excellent website defining the advantages of using hay preservatives to prevent spoilage and heating. <u>Click here</u>. Additional hay-making information is available at the "Team Forage" website by <u>clicking here</u>.

High-moisture hay or baleage:

One increasingly popular way to handle high-moisture hay is to make baleage or round bale silage. High-moisture hay is wrapped in plastic to preserve the crop and minimize and prevent bale heating. The wet hay ferments inside the plastic wrap, becomes silage, and is stable if oxygen is excluded from the bales. If the plastic is punctured or wrapping is incomplete, oxygen can infiltrate the bale. Once oxygen enters the plastic, heating and spoilage are possible.

University of Minnesota Extension has an excellent website filled with advice on making high-quality baleage. <u>Access</u> <u>it here</u>. Among the suggestions offered are:

- 1. Consistent moisture content is key. The sooner moisture drops below 65%, the earlier plant respiration stops and dry matter loss is minimized. By stopping respiration, valuable energy is preserved and sugars found in the plant material are retained to aid in fermentation.
- Bale density is important Dense bales have less oxygen, and lack of oxygen can help to stop respiration of plant material. Trapped oxygen can also lead to mold growth and heating and spoilage of the baleage or wrapped silage.
- 3. Excluding oxygen as mentioned above, oxygen is the enemy of good fermentation. Using a high-quality plastic with a minimum of 6 mil can help minimize the infiltration of oxygen into the bales.

If moisture is not below the 65% range, bacterial growth may not occur and consistent fermentation is unlikely, as mold and wild yeast compete against fermentation organisms. The addition of organic acid blends can help control mold and wild yeast strains. These organic acids work in baleage in much the same way as they work in baled hay. The acid infiltrates the mold cell and eventually exhausts the energy supply, thus killing the mold or wild yeast.

Haylage or hay-in-a-day:

Haylage or alfalfa silage is another way of handling wet forage to help preserve its nutritional value. To make alfalfa silage, the alfalfa is cut and left in the field to wilt until it reaches 60-70% moisture. Depending on weather, the alfalfa may remain in the windrow from half a day to a full day to reach the desired moisture level.

The concept of producing haylage in just one day, commonly called "hay-in-a-day," is catching on among producers who want to quickly harvest their crop and ensure that it retains the highest nutrient content². The rate of drying is impacted by sunlight reaching the forage and the width of the swath. Penn State University has excellent information on making haylage-in-a-day. Visit extension.psu.edu/haylage-in-a-day:

- 1. Make a wide swath to allow the forage to dry more rapidly and shorten the time from cutting to harvest, minimizing post-harvest respiration loss.
- 2. Conditioning crimps plant stems and disrupts the "plumbing" system of the plant.
- 3. Current recommendations are to harvest grass and alfalfa at a theoretical length of cut (TLC) of 3/8-1/2" and corn at a TLC of 1/2-3/4"³.
- 4. In the case of drier feed, poorly packed feed or any other situation that would increase the oxygen present in the storage structure, sugars will be used by the aerobic bacteria, molds, and yeasts³.

If moisture is not within the 60-70% range, bacterial growth may not occur and fermentation is unlikely, as mold and wild yeast compete against fermentation organisms. The addition of organic acid blends or bacterial inoculants will also help control wild yeast and mold growth in haylage. Bacterial inoculants multiply in the absence of oxygen and produce lactic or acetic acid, which preserves the haylage and helps with TMR heating.

Farmers have many options to harvest their alfalfa crop despite the weather challenges this year. Acid preservatives and desiccants allow farmers to safely bale hay at moisture up to 25%. Haylage and baleage require specialized equipment, but can result in excellent forage for feeding during the year. As mentioned in the introduction, university and extension personnel in the Midwest are excellent sources of information, and university websites are a wealth of timely information to help make even the worst weather impacts manageable.

References:

¹Undersander, Dan; "Hay Desiccants and Preservatives"; University of Wisconsin Integrated Pest and Crop Management website; article accessed June 11, 2018, at ipcm.wisc.edu/blog/2017/04/hay-desiccants-and-preservatives/.

²Lee, Karen, Hay-in-a-Day: A Wide Swath More Important Than Conditioning, article accessed May 21, 2018, at

www.kuhnnorthamerica.com/us/ag-practices-trends-hay-in-a-day.html. ³Progressive Forage Magazine, How length of cut affects forage quality, article accessed on May 21, 2018, at www.progressiveforage.com/forage-production/harvest-and-storage/how-length-of-cut-affects-forage-quality.