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High Energy Forages and Soil Building Cover Crops

Hay in a Day: What does it really mean?

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Hay in a day demands a sense of urgency in managing a haylage crop and involves getting the crop dried and ensiled in the shortest amount of time possible. Wide-swathing is the primary technique used to achieve that, getting more of the swath exposed to the sun for faster drying.

Why hay in a day?

Haylage in a day is targeted because the crop retains more quality with less time in the field. **"Forage quality"** means how much nutritional value, especially energy, the animal can take from a given quantity of forage through the process of digestion. Digestibility really means how available that value is to the cow.

If we know that **the quality of forage drives milk production,** what's the best way to optimize and preserve that quality? Tom Kilcer of Advanced Ag Systems, LLC, Kinderhook, NY, has advocated extensively for "hay in a day," which essentially means mowing tedding, chopping, and packing haylage as quickly as possible, and using ongoing photosynthesis as the plant dries to maximize sugar production in the crop.

Kilcer says the factors that drive forage quality are as follows:

- When you start harvesting
- How long it takes to harvest
- How much quality is lost during harvest and fermentation

After mowing, the plant continues the process of respiration, leading to dry matter loss. The longer the plant takes to reach the desired moisture, the greater the dry matter loss through respiration. In general, 2-8% of hay silage dry matter is lost between cutting and ensiling, but this can be as high as 16% with poor drying conditions. More and more digestible components are consumed by respiration every additional hour the forage sits out in the field.

More respiration in the windrow also translates into a longer fermentation time in the silo or bag (because sugars are consumed during respiration, less sugar would be available for fermentation), which means even greater reduction in quality from the same amount of forage.

Wide-swathing is the key to hay in a day. Open the mower-conditioner as wide as possible for a swath of at least 80 percent of cutter bar width. Conditioning is also not used, and neither are shields for the forage to hit as it leaves the disks – that way you can avoid clumps and piles, and make a swath instead of a windrow. Some mowers will require modification to achieve this 80 percent of cutter bar width. This width is critical as your results will not be acceptable with less than 80 percent swath width.

Note: Wide-swathing is not possible with all types and models of equipment. If the swather cannot be modified to the proper width, you may be able to compensate by tedding immediately after mowing and then again at the recommended 2-4 hours post-mowing.

By opening up the swath as wide as possible, the exposed hay surface area is increased nearly three-fold. Sunlight hits more of the hay, the plant actually continues the process of photosynthesis, creating carbohydrates and driving off moisture, and temperature in and around the swath increases, which lowers humidity (another factor that interferes with drying). When relative humidity outside the swath is higher, it's much easier for moisture to escape. Swath core temperatures are significantly higher in a wider swath than a narrow swath – like having "your own personal drying oven in each row," says Kilcer.

A wide swath helps consistency throughout. A narrow swath dries unevenly and stays wet on the inside, which can result in compressed chunks of wetter silage throughout the swath/windrow.

We don't want to crimp or "condition" the forage material, so opening the rollers is also important because you want to avoid aggressively crimping the stems of the material. This reduces the wicking of moisture through the stems to the leaves in the sunlight where the photosynthesis is still taking place and utilizing that water to make sugar. (Therefore the rapid drying process of making hay in a day doesn't happen as readily with "crimped" or "conditioned" hay.)

When tedding, it is critical to move very slowly to avoid forming clumps. Tedding should occur approximately 2-4 hours post swathing. The cut material will change color and take on a grey cast, This is the time point to begin tedding operations. Just as with every other step in this process, focusing on the details greatly improves results and profitability.

The idea behind wide-swathing is to create an environment suitable for rapid dry-down. Minimizing respiration means less potential for loss of the nutrients needed to make milk, which provides readily visible returns to your bottom line. Some of Kilcer's studies show that 9 percent more milk can be produced from a ton of wide-swathed forage. When you can feed better quality forage, you can feed a higher-forage diet – better for herd health. Plus the protein and energy from forage costs one-third that of purchased grain.

And the shorter total interval from cutting to full fermentation creates less protein breakdown and soluble protein overall (Kilcer measured this by the reduction of ammonium N out of total N). Less soluble protein presence in the diet means reduced presence of nitrates in the rumen, and less energy used by the kidneys to excrete the excess.

When wide-swathing, raise the cutter bar to at least 3-4 inches. This helps air circulation around the swath and avoids picking up dirt as the mergers pick up the swath. If enough stubble is left, driving on the swath also won't be as much of a problem.

Above all, avoid leaving your hay out overnight.

For more information about wide-swathing, see http://hayandforage.com/mag/farming_leaving_wide_swath or contact a King's AgriSeeds rep.