

## Making & Baling Hay



Hay is an important feed ingredient on many farms. It provides a source of fiber, along with other nutrients that can impact a feeding program. There are two forage types typically harvested for hay: a) legumes ~ such as alfalfa and clover; and b) grasses/grains ~ such as timothy, brome, oats and barley. Legume hays typically have a higher protein and energy content as well as calcium and phosphorus levels than grass hays. Both types of hay are generally palatable.

Hay quality can be judged by many factors; the most important is the plant's stage of maturity at cutting. The stem contains the fiber while the leaves hold the other nutrients. As the ratio of stem to leaf content increases so does the fiber content. As the plant grows from the vegetative to the reproductive stage, the protein and energy content along with palatability and digestibility decrease. For maximum nutrient content, legumes are harvested when a few flowers start to appear. Grasses are harvested when the seed heads start to appear. Several cuttings may be produced every season, with varying nutritional values. The number of cuttings will depend on the region of the country and the length of the growing season. The first cutting often contains more weeds and has less nutritional value than later cuttings.

Weather conditions at harvest also contribute to the quality of the hay. Rain and sunlight have a large impact on the finished product. Excessive rainfall has many detrimental effects on the cut plant. When overly wet, leaves can be beaten from legumes, soluble carbohydrates are leached out and the hay is packed down so it does not dry properly. If baled in a damp condition, mold is certain to develop,

and the bale is in danger of spontaneous combustion from internal fermentation. Too much sunlight can cause a loss of vitamin A, by bleaching color from the plant.

Knowledgeable evaluation of hay is critical, whether for purchasing or simply feeding to livestock. First, check for flowers or seed heads, which will indicate the stage of maturity at harvest. There should not be any mature seed heads or plants in full bloom. Second, estimate the leaf:stem ratio. The leafier the hay the higher the digestible nutrient content, while the stemmier the hay the higher the fiber content. Color and smell are also important when assessing hay quality. Check for a bright green color that shows minimal bleaching. This typically reflects a lower loss of nutrients. The hay should have a fresh, clean smell. Any sign or smell of mold or dust should eliminate that bale as feed. If buying a large amount of hay, it is suggested that a representative sample be sent to a laboratory for accurate analysis of nutrient content. A knowledgeable eye and an understanding of what constitutes good hay can help to supply livestock with a nutritious feed.

### Tips for Success

- **Cutting at the right time is critical.**
  - Determine plant maturity based on growing degree-days and visual examination, rather than a calendar date... with an eye on the weather.
  - Legume hay is ideally cut at the early-mid "bloom stage"; grass hay is cut at the "boot stage" – when the seed heads are just emerging from the stem. These "stages" provide the most nutrient potentials for the hay crop.
  - In a field containing both alfalfa and grasses, it is best to determine the stage of maturity by using the grasses as a benchmark for cutting.
  - Typically, successive cuttings will have improved nutrient value over the previous cut. This is also dependent on weather conditions throughout the growing period and the time of cutting.
- **Ensure the mowed forage is placed in windrows and is properly dried before baling.**
  - Much of the equipment used in mowing hay fields today will not only cut the forage, but also condition it, which is a means of crimping the stems to aid dry-down and reduce the amount of manipulation that the forage goes through before being baled.

- **Rake or turn the windrows from the bottom of the pile to the top.**
  - This facilitates additional drying, but may also contribute to additional leaf loss. However, if raking is done early and while the plant has adequate moisture (or after an early dew), further leaf shatter and loss can be reduced. Consider using a windrow inverter, which will also minimize soil/ash contamination.
  - The most recent research suggests drying the cut forage in as wide a windrow as possible. This will help to increase dry-down and maintain the sugar content of the hay.
  - When putting up hay (for baling), tighten the rollers on the mower to increase crimping. [When making haylage, the width of the rollers should be wider apart to reduce crimping.]
- **Make sure hay is properly dried-down before baling.**
  - If hay is baled with too much moisture, the bale can ferment and heat, causing a loss in nutrient value and possible spontaneous combustion. It is worthwhile to check the internal bale temperature during the first few weeks, especially if the hay is fairly wet. This can be done by slipping a hand between flakes. Any heat should be noted.
- **Bale size is dictated by equipment and storage, and tightness can usually be adjusted.**
  - A tightly packed bale will be easier to handle and stack, while shedding weather better.
  - If a bale is too dry, tighter packing can help retain more leaves; however, if the hay is too wet when packed, a tightly-packed bale can result in heating and molding.
- **Apply a quality preservative to the hay as it is baled – we recommend FRESHCUT® by KEMIN!**
  - Application of a specially formulated preservative for hay can help reduce heating of the hay, while impacting feedout quality, leafiness, and nutrient value. It also aids in the reducing molds in hay, especially when baled with too high a moisture content.
- **Bales are generally left in a field for several days to cure and sweat.**
  - This helps to ensure that hay is properly dried before stacking for storage.

Quality hay begins prior to cutting, baling and storage. It is important to evaluate fields annually and determine whether or not there is a need for reseeding or over-seeding, as well as the value of fertilizing a stand, which involves soil analysis. Selecting appropriate species and hybrids can also make a valuable difference in the feeding value for livestock.

**Summary:**

<b>Common Varieties Used for Hay Cutting Recommendations</b>	<b>Common Attributes for Positive Impact</b>	<b>Common and Potential Problems</b>
Alfalfa ~ early-mid bloom	High protein and energy; generally a desirable calcium to phosphorus ratio; highly palatable	Needs well drained soil; will shatter if too dry; possibility of blister beetles
Birdsfoot Trefoil ~ early bloom	Does well in poorly drained soils	Low yield; possibility of lower palatability
Red Clover ~ early-mid bloom	Does well in poorly drained soils; high quality protein	Difficult to put up well; notoriously dusty & possible toxicity from mold
Orchardgrass ~ boot	Early start; high yields	Can get tough and unpalatable after early bloom, if not cut in a timely fashion
Timothy ~ boot	Does well in poorly drained soils	Lacks good drought resistance
Brome ~ boot	Drought resistant and high yield	May be unpalatable if too mature and fed alone; low in protein

*For additional information on hay and hay-making, as well as species and seed products available for reseeding, over-seeding, etc., contact Jamie or Wayne at the office: 1-800-346-3649.*