

A Cut Above

Manage hay production for optimal quality.

by Barb Baylor Anderson



PHOTOS BY SHAUNA ROSE HERMEL

Mid-summer hay production across the country may be largely at the mercy of the weather. Still, forage and beef specialists alike encourage producers to pay attention to the factors influencing hay quality that *can* be controlled. From fertilization to fall storage, Angus producers can implement a series of strategies that will help maximize hay quality for winter feeding.

“Maturity is the overriding factor in quality hay cutting,” says Dan Faulkner, animal science professor, University of Illinois, Urbana-Champaign. “If you make your first cutting in May on time, you get better quality hay later on. When you clip

early, you get more cuttings, have better quality and higher energy for the cattle.”

Quality can change quickly

Jim Morrison, a University of Illinois Extension crop system educator in Rockford, also emphasizes a regular cutting schedule driven by the plant’s maturity. For grass or grass and legume mixtures in the Midwest, he recommends a 30- to 35-day cutting schedule, weather permitting. For alfalfa, he says a 30-day schedule or less is ideal.

“You should get the cut on grasses at boot to early head stage and with legumes, such as red clover or alfalfa, cut at early bloom for

the clover and one-tenth bloom for the alfalfa. Your mix will determine your cutting,” he says.

Similar strategies work in the Plains. John Caddel, agronomy and forage specialist, Oklahoma State University, says waiting too long to harvest hay is a real concern.

“It is critical not to let hay go too long before cutting it in the summer because you will definitely lose quality quickly,” he says. “The heat of the Plains is merciless, and beef cattle prefer hay that is less seeded.”

While Caddel advises producers not to let grass hay go to seed, he says some blooms are acceptable in alfalfa hay. He also prefers that producers choose a legume-grass mix.

“We encourage producers here to include legumes in grass pastures. Alfalfa works very well, as does red or white clover, and we have found lespedeza is proven and often underutilized in acid soils,” he says.

In the Southeast, Darrell Rankins, associate animal science professor and Extension beef nutrition educator, Auburn University in Alabama, agrees that the bigger issue there is that many producers are guilty of cutting hay too late and end up sacrificing quality for quantity.

“Every forage is different, but you need to cut hay before the seed heads appear, not after they predominate in the field,” he says.

Bale and store at best times

The best plan may be to cut hay every 30 days, but the weather can alter that plan in any region.

Rankins says the timing for cutting hay may even have to depend on how much rain is in the forecast. “If less than an inch falls on the day the hay is cut, that isn’t too bad,” he says, adding that rain during cutting is not nearly as detrimental to hay quality as rain that falls at the end of drying.

Morrison suggests that in the Midwest, hay be raked at 40% moisture or less. Harvesting at too high a moisture level puts hay at risk for spoilage. “For baling, small square bales should be no wetter than 20% moisture. Large round bales should be no wetter than 18%, and large square bales should have 16% moisture or less to help prevent losses,” he says.

Baling conditions can be facilitated with such products as drying agents or preservatives. Morrison says drying agents work especially well in July when chances for drier weather are better and producers are on their second or third cutting. An agent can reduce drying time in the field by about a day for large, square bales, he explains.

Likewise, large square bales can be treated with a product like buffered propionic acid,

► **Above:** “For baling, small square bales should be no wetter than 20% moisture. Large round bales should be no wetter than 18%, and large square bales should have 16% moisture or less to help prevent losses,” says Jim Morrison, University of Illinois Extension.

depending on the hay moisture content, to preserve mid-season hay quality.

The best time of day for cutting is open for debate. While Morrison says research exists to support afternoon cutting because hay quality may be better then, the studies are not definitive. Caddel says Plains producers normally cut hay just after the dew has dried, and bale at night.

“If you wait to bale alfalfa hay at night when the dew is on the hay, you can help keep the leaves on the alfalfa,” he says. “Producers may want to try cutting hay at different times of the day, have the hay analyzed and then decide when to cut hay for the best quality.”

Storage

Once cut and dried, you need to make storage decisions. If you choose outdoor storage, Morrison warns that significant quality loss is possible. He recommends storing bales away from tree lines and using bale sleeves, netting or plastic covering to protect the bales from the elements and then setting them on crushed rock or pallets.

“Big, round bales can lose up to 4 inches, or about a third of the bale, to spoilage if it is just out along the road. Another 20% to 30% can be lost at feeding because the cattle won’t eat spoiled hay,” says Illinois’ Faulkner. “The problem is that even if you cover the hay or put it in buildings to help prevent spoilage, you are just transferring the cost of spoiled hay to the cost of storage. You should weigh the economics of what is best.”

Focus on mid-season fertility

In addition to cutting, baling and storing issues, producers should also pay attention to mid-season fertility needs. Morrison advises producers to review fertilizer programs in July or August and, at a minimum, replenish what the crop has taken off. In the Midwest, he says, needs are generally greatest for additional phosphorus and potassium in a legume-grass mix. For every ton of hay removed, he advises producers to add 12-15 pounds (lb.) of phosphorus and 50-55 lb. of potassium. Grass hay also requires nitrogen.

“Apply fertilizer after the crop is harvested in late summer,” he says. “Check your yields and compare them to how much fertilizer was applied after the first cutting. Then apply the difference in August or September.”

Caddel says in the southern Plains, grass hay needs nitrogen in the right amount to boost yield and quality. “Applications in the summer are often omitted, but are just as



► Jim Morrison, University of Illinois Extension, advises a regular cutting schedule driven by plant maturity. For grass or grass and legume mixtures in the Midwest, he recommends a 30- to 35-day cutting schedule; for alfalfa, a 30-day schedule.



► If a forage analysis shows at least a 56% TDN (total digestible nutrients), cows can eat 2.5%-3% of body weight and benefit, says Dan Faulkner, University of Illinois at Urbana-Champaign. Cows will eat only 1%-1.5% of body weight of hay at 40% TDN (poor quality), and they won't get enough energy.



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► Producers need to weigh the the cost of storage against the cost of waste due to hay spoilage, says Dan Faulkner, University of Illinois at Urbana-Champaign.

important as spring applications,” he says. “While weather is critical to hay quality, it cannot be controlled. Fertility is an area where producers have some control, and they should take advantage of that.”

Morrison adds that producers who plan to start a new seeding later in the summer or in early fall should plant varieties of alfalfa, for example, that will mature at the same time as grasses. Cutting will be much smoother next spring when all of the plants mature at the same time.

Evaluate hay quality

Mid-summer also provides a good opportunity to have laboratory testing done on hay that is already baled.

“The hay you cut in the heat of summer will be lower quality than early season or late season cuttings and may be higher in fiber,” Morrison says. Producers should sample cores from 20 bales from the same lot or field.

Rankins also advises producers in the Southeast to analyze bales for quality. A forage-testing laboratory can determine energy levels and protein quality of hay so producers can formulate supplemental winter feeding plans.

“When you put up hay and it is going inside for storage, you need to sample the hay now for quality,” he says. “If you plan to keep the bales outdoors, you should wait until fall to sample the hay for quality.”

If the analysis shows at least a 56% TDN (total digestible nutrients), Faulkner says

cows can eat 2.5%-3% of body weight and benefit. Poor quality hay at around 40% TDN means cows will eat only 1%-1.5% of body weight and won't get enough energy.

“If the hay is inadequate, you can supplement protein or energy. But watch that the supplement does not go above half a percent of body weight, or you will see negative effects,” Faulkner says. “Poor forage quality is especially hard on lactating cows. It may be cheaper to purchase alternative feedstuffs than feed hay at that point.”

Illinois research also shows that limiting access to round bale feeders can help make the most of hay quality. “You can program the cost for a desired level of intake and reduce waste. You can cut your feed costs in half with some programs,” Faulkner says. “With 56% TDN hay, you can limit lactating cows to six to eight hours of access to the feeder and give dry cows three to four hours and still have good performance from the cows.”

The key is to match hay quality to your cow herd to get the most benefit. “You have to be realistic about hay production and feeding,” Caddel says. “Don't keep too many animals around because you think you'll have ideal conditions for them. Ideal conditions are rare, and you don't want to feed hay in the summer when your pastures go bad. Instead, maintain a realistic herd size and keep the hay for the cooler months for your best cows.”

Understanding forage quality

Last year the American Farm Bureau Federation (AFBF) released the publication, “Understanding Forage Quality,” which was collaboratively authored by several university Extension specialists from across the country. The authors concluded that the ultimate measure of forage quality is animal performance. Below are some of the other highlights:

► Factors that have the greatest impact on forage quality are forage species, forage maturity at harvest and harvesting and storage techniques.

► Forage quality varies greatly. Knowing forage quality and animal nutritional needs is necessary to formulate rations that result in desired animal performance.

► Leaves are higher in quality than stems, young stems are higher in quality than old stems and green leaves are higher in quality than dead leaves.

► Rain during field drying damages legume hay more than grass hay. The drier the hay when rain occurs, the greater the damage.

► Fertilizing with nitrogen generally increases the crude protein level of grasses, but has little or no effect on the digestible energy of forage.

► Sensory evaluation of forage provides important information, but lab testing is required to formulate rations. Sampling technique is very important.

► Test reports are valuable, but results vary among hay lots, sampling techniques and lab procedures.

► While protein and mineral deficiencies can limit animal performance, digestible energy is more likely to be the limiting factor from forage.

► The more mature and fibrous the forage, the longer it takes to be digested and the less of it an animal will eat.

► Major losses in forage quality often occur from poor storage and feeding techniques. Good animal performance results when animals consume forage that is suitably high in nutrients and low in fiber.