



Ridin' Herd

► by **Rick Rasby**, beef specialist, University of Nebraska

Store hay in location that minimizes losses

High input costs and low calf prices will cause cow-calf producers to ratchet down their production systems to remain competitive. Even though the data suggest that low-cost cow-calf enterprises optimize grazing opportunities, there are situations where cows need to be fed harvested forages. In addition, as a management strategy to help the cow-calf enterprise to be more resilient to weather events, it is probably wise to have some inventory of harvested forage to help manage around situations like drought or winters when grazed resources are covered with snow and ice.

How forages are stored after harvest affects losses that can occur from the time the forage is harvested to the time it is fed. Pounds of forages baled or purchased will not equal the pounds of forage fed because of storage losses. How storage losses are managed will affect feed costs.

Dry-matter losses

Moisture content of forage bales affects losses that occur from harvest to feeding. Dry-matter losses during storage are due, in part, to plant respiration. Plant respiration is a normal plant process that occurs even after harvest. If the bales are less than 20% moisture, there is less dry-matter loss and fewer microbes to carry on the respiration processes as compared to bales that are greater than 20% moisture. At bale moisture contents of greater than 20%, the chances of mold growth are greater, bale

heating occurs, and dry-matter losses are greater.

There are a number of inexpensive, commonsense management practices to help reduce forage losses during storage. Storage losses for large round bales can occur due to how the bale is packaged. There are physical losses of the forage, and there can be losses due to leaching of nutrients and losses due to minor or major heating of the baled forage.

Bale density. That doesn't mean make it heavier and more difficult to handle and transport. A dense bale will "squat" less and

have less surface area in contact with the ground. A dense surface layer will shed more precipitation and protect the inner part of the bale from weathering.

Most producers will use plastic twine to tie bales instead of natural-fiber twine. Plastic twine resists weathering, insects and rodents better than natural-fiber twines. Some producers will use a plastic wrap to wrap around the bale. Bale wraps help shed rain.

Store bales in a well-drained location.

Bales will soak up moisture if placed on a wet or poorly drained site, causing a large layer of spoiled hay on the bottom of the bale. The storage site should allow moisture/rain to drain away in all directions from the bales. A well-drained, 4- to 6-inch (in.) coarse rock base will minimize bottom spoilage. The coarse rocks are not essential, but consider preventing weed growth around bales. Weeds shade the bales and can cause snowdrifts.

Stack yards should be located a reasonable distance from where the forage is going to be fed. Stack yards, in addition to being well-drained, need to be located for easy access even in the worst weather conditions. This will reduce fuel usage at the time of delivery and labor needed to complete the task. Locate bale rows away from fences and tree lines to

► **Left:** These round bales and haystacks are being stored in a stack yard that is fenced and provides easy access. Stacking large round bales usually increases losses. Stacking tends to trap moisture and limits drying action from exposure to the sun and wind.

► **Below:** Inexpensive, commonsense management strategies can help prevent forage losses. These round bales are being stored in a stack yard with about 3 to 4 inches of spacing trapped in between. Some slope to the area provides drainage.



avoid contact with snowdrifts. Keep livestock and other animals out of stack yards.

Store round bales end-to-end. The arrangement of large round bales in outdoor storage can significantly influence the amount of storage loss. Under most conditions, position bales end-to-end. Leave 3 to 4 in. between bales so that moisture cannot be trapped between bales. Orient the bale line northwest to southeast to allow prevailing winds to blow snow past the bales and minimize drifting and the resulting moisture soaking into the bales.

Put the stem-down side of the bale to the north side of the line. The stem-down side tends to shed rain and snow better than the stem-up side. The stem-up side will then receive more sun to provide some melting and drying to lessen spoilage. If more than one line of bales is needed, space adjacent lines at least 10 feet apart. This will minimize snow buildup between rows and allow the sun to reach the back row. Stacking large round bales usually increases losses. Stacking tends to trap moisture and limits drying action from exposure to the sun and wind.

Research observations

Extension specialists at the University of Tennessee conducted a trial to compare different methods of storing large round

bales of grass hay. The hay was cut and baled in June. The bales were weighed at the time of harvest and storage. The bales were weighed again the following January at the time of winter feeding. Following is a list of the type of storage and the resulting percentage hay loss:

- ▶ Bales stored on the ground with no cover recorded losses of 37%.
- ▶ Bales stored on used tires but with no cover recorded losses of 29%.
- ▶ Bales that were stored directly on the ground but were covered with a tarp also had losses of 29%.
- ▶ Bales that were stored on used tires and also covered with a tarp recorded losses of 8%.
- ▶ Bales that had a net wrap and were stored on the ground had losses of 19%.
- ▶ Bales that were stored inside a barn recorded losses of only 6%.

If not producing hay for sale, it is likely not practical to invest in buildings for storage. For these data, the next best option is storing hay bales on something that gets the bales off of the ground using a wrap that sheds the rain. Although not tested in this study, hay stored on the ground in a well-drained area would have similar storage losses to hay stored on tires. Not all states

have similar environmental conditions. In drier environments, storage losses are less and storage management may not be a great concern.

Final thoughts

Take a look at where bales are stored and determine if they are in a location that minimizes losses until feeding. If they are not in the best location to keep storage losses to a minimum, determine where a better location might be for next year. Reducing losses of harvested forages from the time of harvest to the time of feeding will impact forage inventory. Fuel and labor costs have made hay baling an increasingly expensive chore.

Moisture content of the bales at harvest impacts dry-matter losses. In low humidity, those in drier climates experience less forage storage losses. Once the hay is harvested, keeping maximum energy and protein stored for winter feed will help make the best use of the haying expense.



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