

## Minimizing storage losses with big round bales

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Big round bales typically have a higher storage loss than small rectangular bales, especially when stored outdoors. Placing round bales outside on the ground is the cheapest storage method but has the greatest potential for dry matter weathering loss. Most losses that occur during outside storage take place on the bottom of the bales where moisture levels remain highest and air movement is the lowest. There are a number of storage techniques that minimize outdoor storage loss.

- **Make a dense bale.** A dense bale will sag less, have less surface area in contact with the ground, shed more precipitation and protect the inner bale from weathering, and hold more hay inside the bale. Bale density is affected by the baler, the experience of the operator, and the type of hay. Fine stemmed hays form denser bales. The density of round bales should be a minimum of 10 pounds of hay per cubic foot.
- **Use plastic wrap, net wrap or plastic twine.** Twine reduces bale sag, helps maintain bale shape, and provides a tighter, smoother surface. Plastic twine will resist weathering, insects, and rodents better than natural fiber twines. Twine should be wound tight and spaced a minimum of 6 to 10 inches apart for best bale wrapping.
- **Store bales on a well-drained location.** Bales 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 drain away in all directions. A 4- to 6-inch base of coarse rock will minimize bottom spoilage. Other materials that can successfully prevent contact with wet soils and provide some air space between the bale and soil surface are: telephone poles, wooden pallets, railroad ties, scrap pipe, and tires.
- **Store bales end-to-end.** The arrangement of large round bales in outdoor storage can significantly influence storage loss. Pack bales tight enough to maintain uniform shape and minimize contact with the soil surface. Under most conditions, position bales end-to-end as tightly as possible in long lines on a well drained site. A gently sloping site with a southern or southeastern exposure is preferable to maximize solar drying and encouraging drainage away from the hay. Bales should be oriented up and down the slope so that they will not create puddling of surface water. Place the bales near the top of the slope to minimize water flowing around the bales. When more than one line of bales is needed, space adjacent lines at least 3 feet apart. This will increase air flow and allow the sun to reach the back row. Stacking large round bales usually increases losses. Stacking tends to trap moisture between the bales and limits drying action from exposure to the sun and wind. Never store bales under trees. It is highly recommended that large bales stacked outside have some type of temporary cover placed over them for the duration of the storage period.
- **Store indoors or cover.** When bales are marketed or stored for more than one season, consider indoor storage or bale covers. The outer 4-inch thick layer of a 6-foot diameter round bale contains about 25 percent of the total bale volume, so protecting this layer is important! Studies have shown outdoor storage losses range between 5 and 35 percent depending on the amount of precipitation, storage site location, and original condition of the bale. Storage losses are usually reduced by approximately two-thirds with indoor storage and by one-half with good plastic covering outdoors. Beware of the side forces with stacked bales. A high stack (four or more bales) can exert a significant load on the walls of a storage structure.