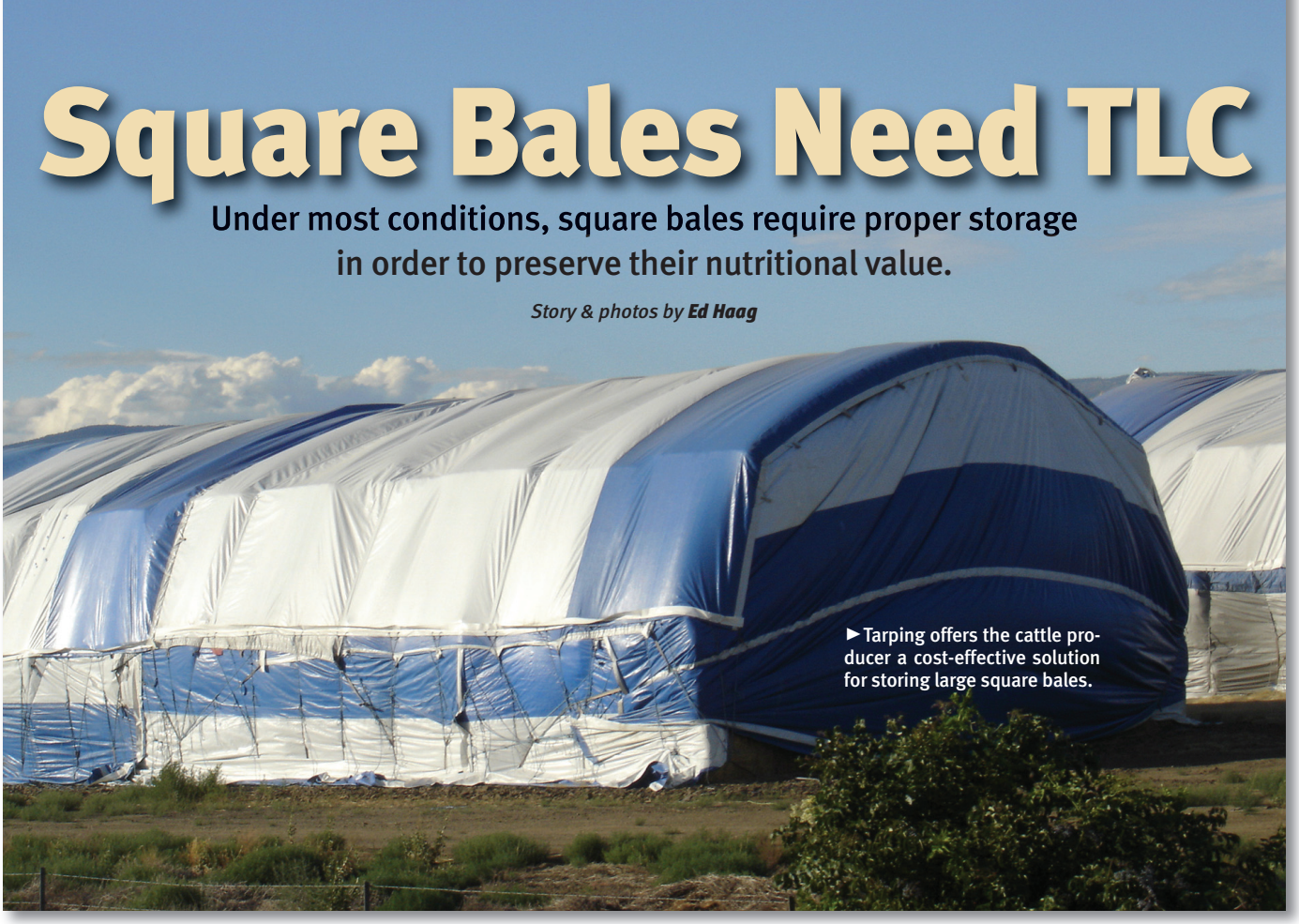
Square Bales Need TLC

Under most conditions, square bales require proper storage in order to preserve their nutritional value.

Story & photos by ***Ed Haag***



►Tarping offers the cattle producer a cost-effective solution for storing large square bales.

If you are buying hay for your cattle on a regular basis, it is very likely that you will, at some time, purchase large square one-ton or half-ton bales.

"These are usually used to put up high-quality dairy hay, but some of it that doesn't make grade for one reason or another ends up being fed to beef cattle," says Glenn Shewmaker, Extension forage specialist at the University of Idaho. While he hesitates to classify any hay today as a bargain, Shewmaker does believe that the savvy cattleman can purchase some real feed value if he keeps his eyes open and is willing to buy on short notice and in volume.

The question then arises as to what must be done with newly purchased large square bales to protect their value. A common assumption among those who do not feed large squares on a regular basis is that, like the large round bales, they have the ability to shed moisture. Nothing could be further from the truth, says Shewmaker, who has extensive experience with large hay bales and what happens to them if left exposed to the elements.

"It is far more important to cover one-ton square bales than it is to cover round bales and even two-string small bales," he says. "Once moisture starts down a large square bale, it will go clear through to the other side."

Shewmaker says he has seen unprotected one-ton bales that have wicked enough moisture to be ruined in their entirety.

"You have a lot more tonnage spoiled if you don't cover a one-ton stack than you would with a comparable-sized round bale stack," he says.

Proper stacking cuts heating damage

Before looking at cover options, Shewmaker warns, anyone contemplating storing square bales should consider their moisture content. Freshly baled hay should be stacked with a slight gap between bales to allow for ventilation and the release of moisture, he adds. Otherwise, the bales may overheat, and valuable nutritive value will be lost.

Mike Collins, head of plants and soil sciences at Mississippi State University, specializes in the harvesting and storage of forages. Most of Collins' state is in a high-humidity region that extends from Maine to Florida.

"With the high density of the medium- and large-sized square bales [800, 1,900 pounds (lb.), respectively], there is more potential in the region for bale heating at a given moisture level (16% or higher)," he says, adding that this can lead to mold and bale deterioration.

The large square bales contain 16 lb. of dry matter (DM) per cubic foot (cu. ft.), while tight round bales contain only 12 lb. per cu. ft., he explains. "This higher density restricts the movement of moisture from inside of the bale to the outside."

Collins notes that dry bale storage, which is in an aerobic (in air) environment, should not be confused with silage that is stored in an anaerobic (airtight) environment. Because of the need for ventilation in dry storage, Collins' first choice for freshly baled high-density square bales in humid regions of the country are roofed structures with open sides.

"The ideal hay shed for these bales is a pole barn with no walls," he says.

This is not as critical with large square bales that have already been stored for an initial period of time, Collins says. "After a storage period, the natural heating in the bale would have reduced the moisture in the hay down to 16% or lower anyway. For that hay you just need to keep the moisture from re-entering the bale."

Collins says for bales with a moisture content of 16% or less, tarping offers the cattle producer a cost-effective solution for storing large square bales.

Consider options

Before making any final storage decisions, he recommends determining an individual's

storage needs and matching them to the appropriate response. The process should include the questions:

- What are the goals of the storage?
- What are the local climatic conditions that will affect storage?
- What are my storage options?
- What option makes the best sense for my operation?

For those cattle producers who have only limited hay production potential and have as a goal to protect every calorie they purchase, the best storage possible makes sense. Preserving hay quality in today's market is probably a lot more cost-effective than trying to buy more hay to replace the quality lost to mediocre storage.

As Collins mentioned earlier, local climatic conditions play an important role in what types of storage work best for square bales in a particular region.

"For example, out West you will see a lot of large square bale stacks that are left open," he says. "But that is in low-rainfall country where the precipitation they get will be in the winter in the form of blowing snow that doesn't deteriorate the hay to any degree."

Collins recommends checking with your local Extension agent or land-grant university to determine what types of structures are best suited to the climatic conditions in your area.

Most hay buyers are faced with a variety of options. Buyers of large bales are no exception, Collins says. These can range from establishing an arrangement with the seller to tarp the purchased stack on site for a nominal fee — with bales removed as needed over a period of time — to building a pole barn in the expectation that there will be a steady flow of large bales over the amortization period. As is often the case with ranching today, it is usually a tradeoff between time and money.

"On one hand you have the convenience of a permanent structure like a pole barn, but unless you plan on using it for 20 years that storage is going to cost more," Collins says. "With tarps it means more work putting it on, but it is a lot more cost-effective in the short run."

Shewmaker agrees that tarps offer excellent protection for the dollar, but he warns that a bargain tarp isn't always the bargain you expect.

"On a lot of the cheap tarps a good wind will rip those eyelets out in a day," he says.

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Tips for tarping

Glen Knopp, president of Inland Tarp and Cover, notes that there are advantages and disadvantages to both sheds and tarps. He believes that the person who owns and stores the large square bales should use the covering best-suited to his operation.

Cattlemen who must store their hay in the same location year after year, who have access to long-term capital and who can amortize the expense of a storage shed over a couple of decades might consider a permanent storage structure such as a hay barn. On the other hand, for ranchers who only periodically purchase square bales or require flexibility and on-site storage in a timely fashion, tarps are probably their best storage option.

"I work with ranchers who throw a tarp on a stack of big bales as soon as they write the check," Knopp says. "It is a low-cost way to protect your investment."

He estimates his company's average charge for installing and maintaining a leased tarp is $3-$6 a ton. The cost of a new, high-quality hay tarp averages out to $2-$5 a ton with a lifespan of four years.

For those considering tarping their own hay, Knopp has the following tips.

- If you must move the hay you purchased to another location, select a site that is high and dry with easy all-weather access.
- Once the site has been determined, prepare a stack pad. This involves laying down a flat, 6-inch (in.) bed of crushed rock, so that stack ends face north and south. This is to prevent the stack's long side from being exposed to the winter weather.
- Next, lay down a guide string for stacking hay so that it remains straight.
- When constructing the stack, be sure that the top two layers on a large-bale stack (top four on smaller bales) form a peak to allow the water to run off the tarp. The bottom layer of bales forming the peak should extend out over the stack to create an overhang. That will prevent rain from dripping down the side of the stack.

Like Shewmaker, Knopp emphasizes that buying quality tarps as opposed to cheap ones will cost less in the long run. He recommends using a high-quality, UV-resistant, waterproof tarp designed for covering hay. It should be a minimum of 6 ounces (14 mil) per square yard.

When securing the tarps, be sure to use a minimum of 100 pounds (lb.) of tie-down pressure. This will prevent the tarp from blowing off in most high winds. Check tie-downs at least once a month. As the hay is being removed out of the stack, roll the tarp back and resecure.

►Recommended for storage of new large square bales in high-humidity regions are roofed structures with open sides.