Big Bale Storage Losses

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You can't always control weather related losses while in the process of making hay, but you should be able to control losses incurred during storage. This was brought out once again in a recent study done at the University of Minnesota.

Researchers compared storage losses and forage quality differences for both big square and round bales in four different storage scenarios as follows:

1. In a pole barn with a north wall.
2. Outside on gravel and covered with a commercial hay tarp.
3. Outside on gravel and uncovered.
4. Directly on the ground (sod) and uncovered.

Bales were stored from September through May. The hay used was third cutting alfalfa with a relative feed value of 135. Round bales were stored pyramid style in piles of 12 bales. Large square bales were stored in piles of 11 bales in a 3 x 3 stack with two bales covering the cracks on top. In general, there were few differences in storage losses or forage quality between round and large rectangular bales. For both round and rectangular bales, the bottom bales stored uncovered on sod were re-wetted from 18 to 32 percent, high enough to cause significant spoilage by mid-June. Dry matter losses for the four systems are presented in Table 1.

Table 1. Dry matter losses for large round and square bales in four types of storage systems from September through May (Minnesota).

Storage type	Dry Matter Loss (%)
Pole barn	2.3
Outside on gravel - covered	4.8
Outside on gravel – uncovered	10.9
Outside on sod – uncovered	11.2

To put dry matter losses in perspective, lets assume you store your hay outside and have a fairly reasonable storage loss of 10 percent. That may not sound all that bad, but a 10 percent storage loss means that for every 10 bales of hay that you put into storage, you really only have 9 bales worth of hay left to feed. Of course, in addition to the dry matter losses, there are decreases in forage quality and increased waste with feeding weathered hay.

The most eye-opening part of this trial came when the hay was sold. Inside/covered bales sold for $75 per ton while the uncovered bales sold for $45 per ton. For this study that amounted to an $1800 total difference on a relatively small number of bales. It's worth noting that the same price was received for hay stored on gravel and covered as stored in the barn. This shows that hay storage systems don't have to be fancy to be effective.

If you would like to analyze your storage costs further Brian Holmes, Professor and Extension Specialist - University of Wisconsin, has put together an Excel spreadsheet that can be downloaded at http://www.uwex.edu/ces/crops/uwforage/storage.htm . Using this spreadsheet with a standard set of assumptions (your inputs may vary), Brian Holmes found that the lowest cost alternative in both 6 and 12 month storage systems is the use of a crushed rock base with a tarp covering. (see figures 1 + 2 below*)

Figure 1. Annual cost of round bales stored for 6 months

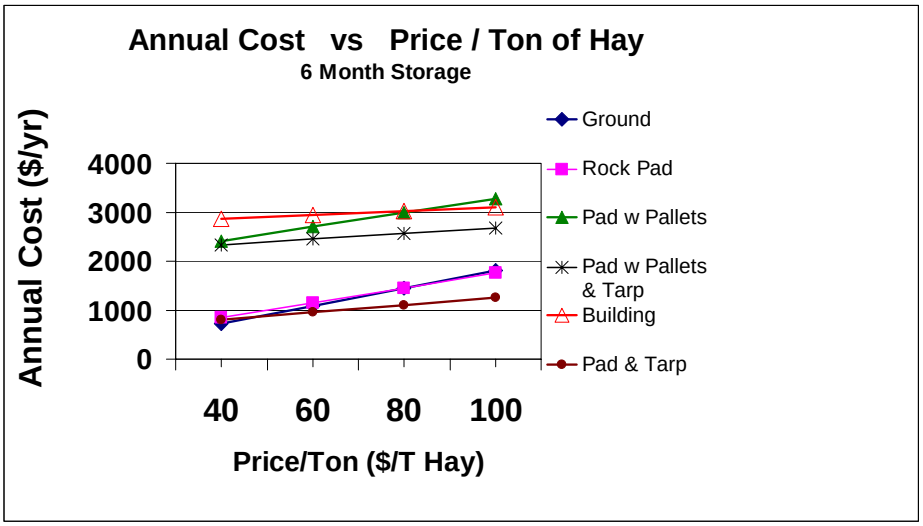
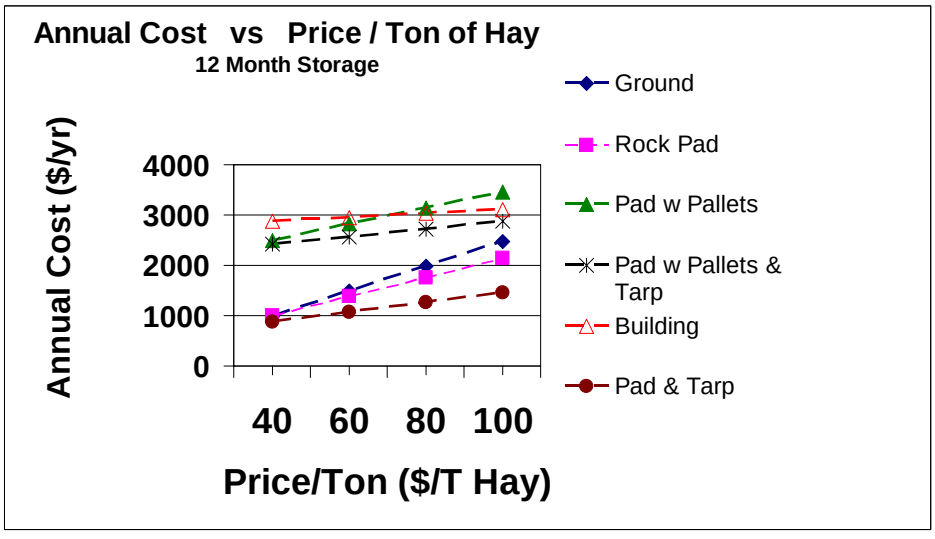


Figure 2. Annual cost of round bales stored for 12 months



*The results of this analysis are appreciably affected by the assumptions used for capital costs and DM losses. Various methods of making round bales and the various weather conditions (moisture and temperature) will affect DM losses. Thus, producers should do their own analyses using the spreadsheet to include their own conditions and assumptions before deciding on their choice of a storage system.