

# BY DESIGN

## Winter hay storage — research shared on best methods

by Heather Smith Thomas

Ranchers need to plan ahead regarding winter forage supplies, and this includes finding ways to store hay that help preserve quality and reduce moisture damage. Emily Glunk Meccage, former forage extension specialist in the Department of Animal and Range Sciences at Montana State University (MSU), was involved with a research project last year, looking at round bale storage outdoors. Not everyone has the luxury of hay sheds, and there is a lot of hay stored outside.

“We found that how you stack the hay does affect the quality and the moisture retention of those bales over winter,” says Meccage. “You want to minimize the amount of moisture and mold in those bales because that can affect cattle health and performance.”

Danielle Peterson, livestock production specialist with Purina Animal Nutrition, was a graduate student at MSU during that study, and the research was part of her thesis. She says that after processing the data, results were similar to other studies. Indoor storage is best; however, for

outdoor storage, single-bale high in a long snake seems to be the most consistent for retaining quality within bales. The pyramid stack is intermediate.

“We did see some differences between bales that were stored at the top of the pyramid and the bottom,” says Meccage. “But the mushroom stack, where the bottom bale is upright and another placed on top of it, had the most variability.”

“We found that the top bales had hardly any change in quality, but the bottom bales soaked in moisture that

ran off the top bales, as well as moisture from the ground surface,” says Peterson. “Visual quality of the bottom bales from the ground up was much lower than visual quality

from the top down.” The bottom bales were significantly lower in total digestible nutrients (TDN) and energy

content, and higher in moisture content than the top bales. This reduction in forage quality can have an effect on animal performance, says Peterson.

If you are feeding one group of cattle the top bales and another group the bottom bales, they might be getting

completely different nutrient levels, even if the hay was harvested from

the same field. “We did a two-year study, and at one of our locations, we saw a lot more mold growth in

bales in the pyramid stack than we did the first year,” says Meccage.

Each year is a little different in the quantity and the timing of moisture those bales receive.

Peterson says there are different amounts of precipitation at various locations on any given year. Thus hay storage results — dry matter and quality loss — differ for each year.

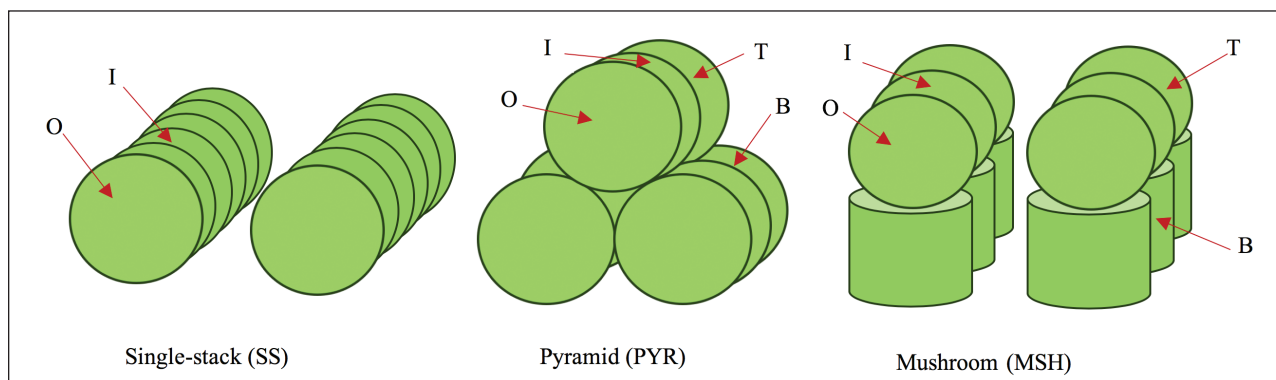
For example, during the second year of the study, the hay storage location at Havre, Mont., had extremely high precipitation



Indoor storage is best; however, for outdoor storage, storing single-bale high in a long snake seems to be the most consistent for retaining quality within bales, reports Danielle Peterson of her graduate student research.



**Fig. 1: Three common hay storage methods in Montana: the single-stack (SS), the pyramid (PYR) and the mushroom (MSH). I = bales stored on the inner part of the stack; O = bales stored on the outer part of the stack; T = bales stored on the top of the stack; B = bales stored on the bottom of the stack.**



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compared to other years. Moisture that freezes won't create as much mold as moisture in warm weather.

"When planning long-term, it's often a good idea to hold some hay in reserve in case we have a bad year. If you plan to keep some hay over for the next year, it pays to try to stack the hay in a manner that it will keep better and not be ruined by moisture," says Meccage.

A person could afford to build a hay shed with the money lost in damaged hay over time.

Hay that's been stored outside, uncovered, may decline in dry matter and quality, says Peterson. Feeding moldy hay can result in lower animal performance — lower average daily gains (ADG), poor animal health, and even abortion in cows.

Return on investment varies

depending on how much hay and what type of hay you store, but a hay shed will pay for itself over several years.

"One of the cheaper options that has a beneficial effect fairly quickly is just to decrease the hay-to-soil contact," says Meccage. "Having a gravel base to stack hay on will greatly reduce moisture damage. Putting hay on pallets, railroad ties or gravel will allow for drainage and eliminate moisture wicking up into the hay from wet ground. This will help preserve hay quality." ■



Editor's note: Heather Smith Thomas is a cattlegirl and freelance writer from Salmon, Idaho. Photos and diagram are courtesy of Danielle Peterson.



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