



Answers to questions about structures, ventilation, soil, water, waste, energy, machinery and safety.

## Sizing and siting hay barns

The unpredictable weather in the Missouri Ozarks makes any hay harvested a valuable commodity. To retain that value, a hay storage barn is a good investment that will pay for itself in five to nine years, ignoring all other alternative uses for the barn. In reality, the barn offers further investment value as shop area, machinery storage or livestock housing, and insurance coverage is obtainable to cover potential fire losses.

Sizing a hay barn depends on bale type, quantity, and method of filling and feeding. Provide a minimum of 16 feet of eave height clearance. Allow 250 cubic feet of storage per ton of small square bales and 310 cubic feet per ton for large round bales (which are less dense). Multiply together the barn's length, width and eave height in feet to get the amount of cubic feet. Another way to size barns for large round bales is to allow 30 square feet of floor space per ton if stacked two-high or 20 square feet per ton if stacked three-high.

When locating the hay barn relative to access roads, other buildings and utility lines, allow clearance for the largest vehicle that is expected to be used over the life of the barn. Semi-trailers require a minimum 55-foot turning radius and 13½ foot interior height clearance. Self-propelled bale wagons require 17 feet of overhead clearance for stacking hay. While a 40 foot barn width is an economical dimension, some automatic bale wagons require different dimensions, such as multiples of 8½, 11 or 12 feet. Check with the dealer to be sure. Also, consider placing the barn in an area where it can be used as a winter windbreak from the north and west for livestock.

In the barn design, be sure to consider ventilation. Ridge and eave ventilation will make the barn cooler, reduce roof corrosion and remove excess moisture given off by the hay. Allow a minimum of 6" of continuous ridge ventilation, or 2" per 10 feet of building width, whichever is greater.

For those lower-value hays that you think won't justify a barn, below are four rules for outside, covered storage that will keep losses as low as inside storage.

- Select a site that slopes away from where the bales will be stacked, with access to an all-weather road.
- Stack as many bales as the equipment and bales will safely allow (usually 3-4 high). Pyramiding is better where bales have variable densities. More bales together means less total tarp and rock cost.
- Make a 4"-8" thick base of 2"-4" diameter crushed rock for the bales to set on. This is critical in stopping the "wicking" action the bales have for drawing water from the ground.
- Cover the hay with reinforced (rip-stop) plastic or a canvas tarpaulin, and anchor with plastic twine tied to old tires, with posts under the stack, or with "T" stakes in the bales or ground. Do not use 6-mil plastic because it wind-tears too easily.