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PRODUCES HIGHER-QUALITY HAY

Wood-Burning Dryer For Big Round Bales

By Bill Gergen, Associate Editor

"My home-built big bale dryer fueled by a wood burning stove lets me dry up to 8 high moisture bales at a time inside my storage shed, resulting in high quality hay that's worth \$25 more per ton. It works great," says James Fogal, Neelyton, Penn.

Bales are dried on four 30-in. dia. air outlets at the top of a concrete duct in the floor of Fogal's hay shed. The wood stove is housed inside a 7 by 7-ft. concrete building, or furnace room. A 4,500 cfm axial vane fan is mounted inside a metal duct that connects the furnace room to the metal duct under the storage shed 15 ft. away. The fan pulls outside air through a screen on one side of the furnace room, over the wood stove, and forces the heated air up through the bales.

"Baling at a high moisture content reduces weather damage and saves more leaves," says Fogal, who sells hay to local dairy farmers. He built the bale-drying system three years ago with the assistance of James Garthe, an extension agricultural engineer at Pennsylvania State University. "We have an abundance of low quality and cull trees in our 80-acre woodlot so our fuel supply is quite inexpensive. In our location solar heat isn't practical and the wood stove can deliver heat 24 hours a day.

"It's important to start drying high moisture bales as soon as possible after baling, ideally within the first two to three hours, to prevent heat buildup inside the bale. The higher the bale's moisture content, the harder it is to get air through it. We usually bale at 28% moisture and use the stove to dry bales down to 20 or 22% moisture. We load the stove with wood about every six hours. It heats the air to about 100° and raises the temperature inside the bales by 20 to 30°. We run the fan continuously and under ideal conditions four bales can be dried in 24 to 36 hours. When the bales are dry we keep the fan going until the fire dies out and the furnace room cools down. If we have more bales to dry, we remove the cured bales from the ducts. If not, we may wait 24 hours, then run the fan again just to make sure the bale is dry. If cool air comes out of the bale, it's dry. But if warm air comes out, there's still moisture in the bale producing heat."

If moisture content in the four bales is 26% or less, Fogal can stack a second layer of bales on top of the first layer to dry 8 bales at a time. However, it takes too much heat to

push air all the way through a double layer of higher moisture bales. "If moisture content in the four bales is closer to 30%, we run the fan for 12 hours, then stack a second layer of bales on top of them," says Fogal. "My system is geared for a small farm, but I think I've reached the optimum combination of fan size and duct length. I wouldn't want a longer duct or larger fan because the increased air pressure would result in more air escaping through cracks or at the bottom of the bale. I'd have to add additional ductwork and fans to effectively increase capacity."

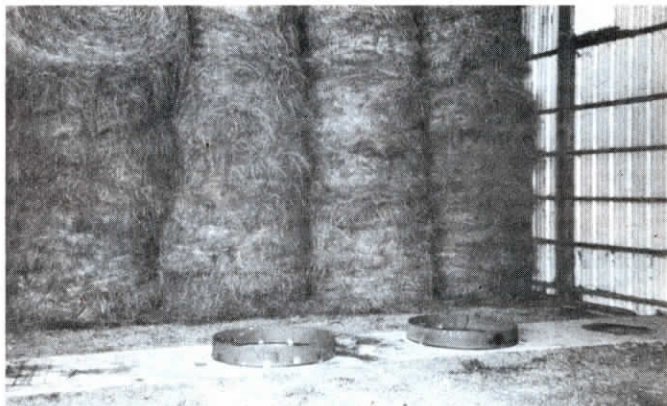
According to Fogal, the bales must have a solid core and be well compressed and even in density. His hard-core bales weigh 1,200 to 1,500 lbs. when dry. "Soft core bales won't dry evenly because air is blown up through the center of the bale and out the top without reaching the sides. Because of the way round bales are formed, the natural flow of air is up through the bale. If too much air is blowing out the top, I lay a 30 in. dia. plywood disc on top of the bales to force air through the sides of the bale."

Fogal built the 2 ft. dia., 4 ft. long stove from 3/8-in. thick gas line pipe. Switches let him turn the fan on and off from either the hay shed or wood-burning building. Fan is powered by a 5 hp motor. A spark arrester screen is located on both sides of the fan inside the ductwork. Another spark arrester screen is located atop stove's chimney.

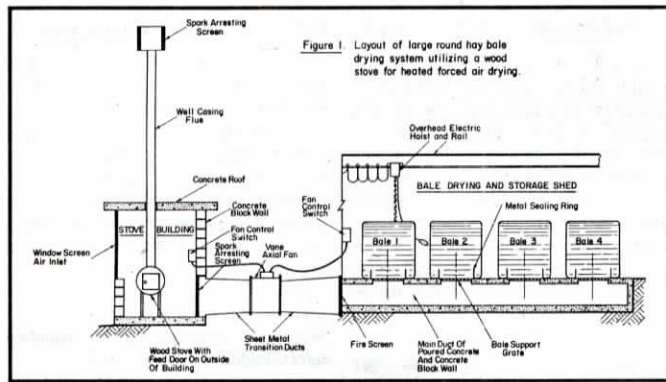
A steel ring is positioned on each outlet on the concrete duct. The bale's weight causes it to "seal" on the ring to prevent air from escaping around the bottom edges of the bale.

Fogal uses a 1-ton electric hoist to lift bales on and off the grates. The hoist rides on a trolley system along a track in the peak of the shed and is equipped with a 3-chain bale grapple. He uses a front-end loader equipped with an innovative home-built hook that attaches to the top lip of a loader bucket to stack dry bales three high on end. "The hook is designed so I can pick up bales lying either on their end or side and release them without getting off the tractor," says Fogal, who has built several bale hooks for his neighbors for \$65.

Contact: FARM SHOW Followup, Jim Fogal, P.O. Box 14, Neelyton, Penn. 17239 (ph 814 259-3343).



Bales are dried on four 30-in. dia. air outlets at top of a concrete duct in shed's floor.



Plastic 55-gal. barrel is suspended off ground so it swings when cattle bump into it.

"THE SWINGER"

"Bull Proof" Mineral Feeder

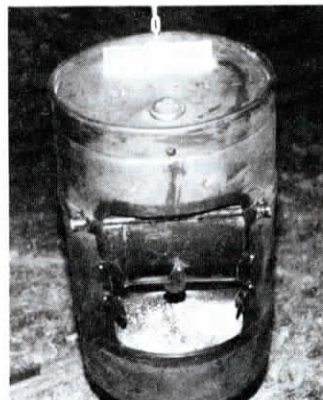
"Even the toughest, meanest, strongest bull can't break or damage it," says Alan Schaefer of the indestructible mineral feeder-insecticide applicator he makes out of plastic 55-gal. barrels.

The secret is to suspend the barrel off the ground (so it swings and sways when cattle bump into it) and at a slight angle (to help keep rain or snow from entering the feeder's opening).

Called "The Swinger," you load it with salt and mineral (loose or block form). When an animal comes to eat, its forehead bumps a plate which, in turn, activates a built-in insecticide applicator, shooting a stream of liquid spray along the animal's back, from head to tail.

You can hang the barrel from a tree branch, or to a self-standing mounting frame. To load it with mineral or salt, just back up to it with your pickup, letting the barrel rest on the tailgate. After filling, you simply drive away, letting suspended barrel dangle.

Retails for \$119 and comes in black, white or blue. Carries a 5-year warranty



Animal's head bumps a plate which activates built-in insecticide applicator.

against cracking, breakage.

For more information, contact: FARM SHOW Followup, Alan Schaefer, Hay Wrap Inc., P.O. Box A, Bloomsdale, Mo. 63627 (ph 1-800 248-9727, or 314 483-2552).