"Free" Fescue Straw Heats His Shop And Home

Lewis Stickney figured out a way to use a waste product and save up to $2,000/month in heating costs during the coldest months. He bales hard fescue straw and burns it in his homemade burner.

The Hythe, Alta., farmer explains that a hard fescue variety he used to grow contained an endophyte, which caused livestock hooves to deteriorate. Because the crop was prone to disease, it was best to remove the straw from the field. Six years ago he decided to bale and burn it. Though today's varieties are now safe for livestock, he continues to use the straw as a fuel source in the burner he built out of two large underground fuel tanks. With just 50 bales a year he heats a 6,000 sq. ft. shop and half of his 1,800-sq. ft. home. By this winter he plans to have his whole home hooked up to hot water heat.

Stickney cut a 7-ft. dia. hole in a 9 by 30-ft. tank, built skids inside and slipped in a 7-ft. by 20-ft. tank. He welded the tanks together at the door opening on the end and cut a manhole at the top of the opposite end for access to brace the inside tank.

"I needed to keep the tank secure, because once it was surrounded with water, I calculated that there would be an upward buoyant force of approximately 50,000 lbs.," Stickney says.

"I cut about 7-in. off the end of the 7-ft. dia. tank to use for the door. I didn't want to have to circulate water through the door, so I put in 2 in. of high temperature insulation (2,000 degrees F) and then filled the remaining 5 in. with refractory cement, which is mixed up in a mortar mixer. It hardens like cement and is held in place by anchors welded to the inside of the door. The door is 7-ft. in diameter and, with the refractory cement, weighs about 2,000 lbs."

Mounted on thrust bearings and heavy hinges, the door opens and closes with a mere 4 to 5 lb. of force.

Besides heating the 6,000 gal. of water between the tanks and 6,000 gal. in an additional storage tank, Stickney's heater burns the smoke.

"I didn't want the smell of burning straw, so I knew that I wanted to be able to burn the smoke," Stickney says. He borrowed ideas from a corn stoker burner and from his engineering son.

When he loads the heater with two bales, he throws in a match and the fescue straw starts on fire. Within a couple of minutes a 3 hp. blower near the chimney makes the fire hot enough that the flue gas becomes clear and odorless.

"We feel that approximately 2/3 of the heat generated is from the smoke and only 1/3 from the initial burn," Stickney says. To capture that extra heat generated before it passed out the chimney, Stickney made a heat exchanger out of pipes that passes through the water jacket in the 10-ft. space behind the combustion chamber. The flue gas passing through these pipes accounts for the majority of heat captured.

Lewis Stickney bales hard fescue straw and burns it in his homemade burner.

Burner was built out of 2 large underground fuel tanks.

"One other problem was that when we were doing a burn, we were producing heat so fast that, even though the water jacket held about 6,000 gal., it would soon start to boil. We installed a swimming pool pump ($100 on eBay) to circulate the water when the burner blower is on."

Finally, the outside of the furnace was sprayed with 3 in. of polyurethane insulation. He added additional high temperature ceramic insulation by the door for safety, and covered it with 16 gauge mild steel. He recently added ceramic rope to build an airtight seal around the door.

Stickney bales the fescue straw in August and keeps it outside. Typically, he puts in two bales at a time with his skidsteer loader when the water temperature has dropped below 100 degrees. The fire is out when he loads the bales. The bales burn up within a couple of hours. If he does three burns in a day, he can store up enough heat for a couple of weeks to keep his shop at 70 degrees.

"Straw gives off about the same amount of heat per pound as wood," Stickney says. "One advantage of burning fescue straw is it burns with so little ash that I only have to clean out the burner once a year."

Altogether, Stickney estimates he spent less than $5,000 to build his heating system. Readers interested in more information should contact Stickney by email.

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Portable Ball-Type 5th Wheel Hitch

This new portable ball-type 5th wheel hitch eliminates the need to modify your pickup box by making use of a receiver hitch. Best of all, it can be easily removed, leaving your pickup bed free and clear.

The patent pending Handy Hitch consists of a 4-in. sq. steel tube equipped with a 2 5/16-in. ball that fits between the wheel wells, and a J-shaped, 2-in. sq. steel tube that runs back to the pickup's receiver hitch. Two 4-ft. lengths of 3/8-in. chain cross each other and connect to I hooks at the front of the pickup bed.

The 4-in. tube can be fitted with a rubber bottom and rubber side pieces to keep the bed from getting scratched.

The unit can be made in 2 sizes for shortbed or longbed pickups. A pair of solid metal rings serve as safety hooks for the goosenneck trailer.

"I came up with the idea because I wanted to pull a livestock trailer but didn't want to drill holes in my pickup bed," says inventor James Churchill. He says he's looking for a manufacturer.

Contact: FARM SHOW Followup, James Churchill, 12760 149th Ave., Menahga, Minn. 56464 (ph 218 252-9740; animals_r_wild@yahoo.com; www.inventionhome.com).

New device lets you use a 5th wheel hitch without having to modify your pickup bed.

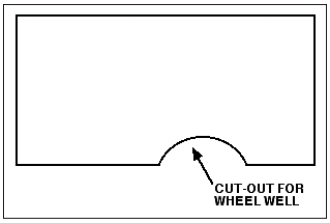
Steel tube equipped with a 2 5/16-in. ball fits between the wheel wells. J-shaped steel tube runs back to pickup's receiver hitch.

Sideboards Boost Pickup Capacity

"A pair of 4 by 8 sheets of plywood, with cut-outs for the wheel wells, provide a low-cost way to boost the storage capacity of my pickup bed," says Bob Mangus, Apollo, Penn.

He uses his pickup to haul bales of wood chips for bedding. "Without the sideboards I can only haul 20 bales. With them, I can haul 48. The weight of the bales holds them in place. When I don't need them I just set them against a wall for storage. My total cost was only about $30."

Contact: FARM SHOW Followup, Bob Mangus, 929 Robin Dr., Apollo, Penn. 15613 (ph 724 910-5783).



Sideboards consist of 4 by 8 plywood sheets with cut-outs for the wheel wells.

Bale cart rides on bicycle wheels, making it roll almost effortlessly, says Mommens.

Handy Bale Cart

"I got this idea several years ago when I started to have back and knee problems. I was feeding small square bales to my goats and it was getting increasingly harder to carry the bales around," says Galen Mommens, Tecumseh, Neb., who made a 2-wheel bale cart.

"Since I only needed to move one bale at a time, I didn't need anything that big. I looked through my scrap pile and came up with a lightweight, durable and inexpensive design. I used plumbing parts for the frame, which can be connected without welding. Then I attached a couple bicycle wheels.

"It's been a big back saver. It's designed so the weight is balanced over the wheels. It rolls almost effortlessly. I also use it to haul loads of branches and I can fit it with a large plastic tote to carry leaves, grass clippings and other cargo."

Mommens has a website with an entertaining blog and do-it-yourself info about the hand cart and other projects.

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