She Turns Dairy Manure Into Fuel

Rose Marie Belforti turns excess dairy cattle manure into burnable bricks. A mixture of manure and bedding is compressed, dried and stored until needed.

"We've burned them in an inside fireplace, a wood stove and in an outside fireplace," says Belforti. "They burn with no animal smell, with a scent a bit like incense. It's a good use of what is often considered waste."

Belforti has been making fuel from her well-bedded dairy cattle manure for years. Until recently, she would hand press it, then put the bricks on boards and let them dry.

"You can use the small, hand-pressed pieces like kindling, but if you want larger, tighter bricks, you need a press."

A couple of years ago, Belforti got serious with her dairy manure fuel. She applied for and received a Farmer Grant from the Northeast Sustainable Agriculture Research and Education Program (SARE). The grant was for making a hydraulic manure press scaled for small farm use.

Belforti worked with Chris Callahan, a technical advisor from the University of Vermont, and Steve Lonsky, a local welder. They came up with a press chamber that will produce a 7 by 9 by 9-in. briquette with a dry weight of approximately 4 lbs. The 3,000 psi, 5-in. bore, 24-in. reach, hydraulic cylinder and pump are powered by a Honda OHV, 270cc, 8 1/2 hp. engine. "The press could easily be made from a modified log splitter," notes Belforti.

Equipment and materials totaled just under $2,400, and labor ran $3,662 for the prototype. Details on the make and the testing can be found at the SARE and FarmHacks websites below.

Once completed, Belforti began working on what became her biggest challenge, a good "recipe". She tested different ratios of fresh manure and manure/bedding (straw and wood shavings) to come up with a mix that pressed well and dried efficiently with reasonable density.

"The criteria for excellence is that the briquette must hold together so it can be handled and set to dry," says Belforti. "If too moist, it won't survive the pressing; if too dry or not well mixed, it will crumble during handling."

When she began making briquettes, Belforti quickly discovered that gaps in the press chamber were a problem. Under full compression, too much material was pushed out of the box, not just the excess water.

After trying various fixes, Belforti found that inserting a composite shingle and fabric screening at the end of the chamber held the solids while allowing the liquid to be pressed out. She also discovered that a piece of tarp over the top as a brick was being pressed prevented what she described as "manure rain."

Once the bricks are pressed, Belforti places them on racks in a single layer to dry under roof for several weeks. The closer to 100 percent moisture-free, the higher the btu value in the brick. At 10.5 percent moisture she estimates a brick will produce 6,841 btu's per pound.

"Typically, they should dry in a greenhouse or hoop house with good air flow," says Belforti. "They need to be turned or have a fan on them."

Using the press, Belforti was able to produce an average of thirty, 3-lb. bricks per hour for press operating costs of $2.10.

Although Belforti reduced her herd size when moving to a smaller acreage in Texas, she continues to make manure bricks.

"I wanted to see if it was worth it to make a press, and it was," she says.

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Rose Marie Belforti wanted to turn excess dairy cattle manure and bedding into burnable bricks, so she made this hydraulic manure press for small farm use.

Photos show Belforti loading brick ingredients into machine's press chamber, and a finished pressed brick that weighs about 4 lbs.

Ed Clayton wanted to raise the deck on his zero-turn mower without having to push down hard on the pedal, so he replaced it with an actuator kit mounted below the seat.

Power Lift Raises Mower Deck

Ed Clayton of Chesterfield, Va., was happy with his Dixie Chopper 72-in. zero-turn mower but wished it had a way to raise the mower deck without pushing down hard on the pedal. "I have a Kubota with a hydraulic-control deck, and wished that my Dixie had something similar."

Clayton purchased an actuator kit online for around $120, which included the switch he used. "I added a fuse between the battery and switch. The wiring fit well under the seat." The actuator was mounted to the mower deck using the existing connection with the pedal removed and a pin to connect the actuator arm.

The actuator mounts to the mower frame directly below the seat, with a metal rod for added support. "I've been using this for 3 months now and it works great," Clayton says.

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He Made New Gator Doors For $175

Ken Veach, Zwingle, Iowa, couldn't justify the cost of doors for his 2014 Deere Gator 825i, so he made his own for only about $175. Painted black, they look factory-built.

"I'm happy with how they turned out. I didn't modify the Gator at all," says Veach. "I bought the Gator used equipped with vinyl zipper-type doors, which blocked the wind but got damaged easily. Also, the doors were hard to get in and out of and could shrink in cold weather. Deere sells aftermarket glass doors but they cost about $3,000, and other brands sell for $600 to $2,500.

"The doors and windows I built are easy to remove. They offer better visibility than commercial ones made from solid vinyl, and can be lifted off in good weather."

He bought a 4 by 8-ft. sheet of 1/8-in. thick steel from a local warehouse for about $100. He also bought door handles, 1/8-in. thick plexiglass, storm window clips, and gate hinges at a local hardware store for about $150.

"I drew a cardboard pattern and used it as a template to cut out the doors and windows. A plasma cutter and double cut saw were the only tools I used," says Veach.

The T-shaped, spring-loaded storm windows clip onto the door to hold the plexiglass windows in place. There are 12 clips on each door. "I can quickly replace any window if it gets scratched or remove it for summer use," says Veach.

He bought 2 bolt-equipped gate hinges for each door, and they fit into the Gator's existing door hinges. "To remove a door, I just lift it off," says Veach.

The door handles work like barn door latches and are screwed onto the front part of each door. The Gator came with a triangle-shaped open space just ahead of each door, so Veach velcroed in a piece of plexiglass to seal them up.

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Home-built doors have bolt-equipped gate hinges that fit into Gator's door hinges. "To remove a door, I just lift it off," says Ken Veach.