



Home-built corn stalk bale burner pre-heats air for Ries's crop dryer. A length of plastic tubing runs to base of wet grain holding bin.



Dryer fan on other side of holding bin pulls air through wooden ductwork into dryer.

Round Bale Burner Cuts Drying Cost

Nick Ries, Hastings, Minn. cut his corn drying natural gas bill by more than half last year with the help of a home-built corn stalk bale burner that pre-heats air for his crop dryer.

The furnace is buried in an earth berm near his bins and is built out of an old asphalt boiler that measures 30 ft. long by 7 ft. in diameter. A door was cut into one end, big enough to slide in large round bales of corn stalk residue. Ries feeds bales into the furnace with a front-end loader.

Channel iron, sq. tubing and plate steel

were used to form a jacket around the outside of the firebox, capturing heat that's pulled off by a piece of steel culvert pipe. A length of heavy, flexible plastic tubing runs to the base of the wet grain holding bin. When Ries fires up a bale and then turns on the dryer fan, air is pulled through a wooden ductwork on the other side of the bin and into the dryer.

"The burner delivers 95 degree heated air to the dryer. It lowers the humidity which results in fabulous drying," says Ries. "We burned two bales per day over a 45-day pe-

riod and dried about 200,000 bu. of corn. It worked better than I had hoped. There are only a couple of pails full of ash left after burning because it burns so hot.

"It really saves on our propane bill. I figured our fuel bill would have been around \$35,000 instead of about \$15,000."

He says each corn stalk bale burns one to two days, depending on outside temperatures.

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Furnace is built out of an old asphalt boiler, with a door cut into one end.



Solar-powered water tank can be quickly moved from place-to-place on pasture.

Solar-Powered Mobile Stock Tank

Rotational grazing is a whole lot easier with a solar-powered mobile watering tank that can be moved from paddock to paddock with an ATV or pickup.

Marvin Jackson of Sundog Solar says, "We saw the need for a turnkey system that could be set up quickly and easily by someone with no training in solar power or water pumps. It also needed to be easy to move."

Jackson succeeded on all counts with a solar water tank on wheels with a panel that folds down for highway transport or can be towed from spot to spot in a pasture with only a few minutes to take down and set up.

"The system is balanced so it puts only 112 lbs. on the hitch in transit," says Jackson. "It's also easy to level, even on a slope. The float is on a slide arm that takes only 30 sec. to adjust. It's easy to set up."

The base unit has a 600-gal. capacity with 27 linear ft. of drinking area. Jackson estimates it can service as many as 350 cow calf pairs. "The largest system we have built so far was for an intensive grazer moving 1,000 stockers as often as every day," says Jackson. "They figure they're gaining \$20,000 more profit by having fresh, clean water and pasture rotation over a standard pasture system with dugouts or ponds for watering."

The system has batteries to handle overnight and limited daytime watering. How-

ever, it's not intended for longer term pumping. If multiple day cloudy conditions are common, the solar array can be supplemented with a fold-down wind generator.

The All Season system is designed to handle cold weather with automatic drain-back when pumping is completed. An insulated insert keeps water in the tank from freezing, while optional drink tubes provide additional access.

"We have a customer who overwinters 550 cows in northern Alberta," says Jackson. "He uses both solar and wind to power his system, and it has worked fine, even with temperatures as low as minus 50°."

Sundog All Season Portable Water Systems start at \$5,000 (Canadian) when equipped with skids instead of wheels. Wheels add an extra \$1,000. Adding the insulated tank option adds another \$1,500. The 1,000 stocker system with 12,000 gal./day pumping capacity costs around \$20,000. Jackson says the system has worked well over the past five years with minimal changes needed.

"We have quite a few customers who have bought two or three more systems after trying one," says Jackson.

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Paul Heers uses a solar panel and pump to deliver water through an underground pipeline to six 900-gal. tanks.

Cattle Watered By The Sun

Instead of spending \$20,000 to bring in electricity, Paul Heers, Jr., went solar to provide water to his beef cattle on pasture.

The Oakland, Minn., farmer has 114 acres of pasture. He set up rotational grazing paddocks and installed a 7,000-ft. pipeline to provide water close to the feed. In the past, cattle drank from drainage ditches and creeks.

After getting a quote from the electric company, Heers decided to check out solar.

As it turned out, going green was more economical. His property was eligible for government programs to assist in the cost of protecting water in a creek and flood plain that run through his property.

Heers worked with Little Sioux Prairie Co. in Spencer, Iowa, and purchased a solar panel and pump for \$8,300. The well cost \$5,000 and pumps 8 to 9 gallons per minute through 1 1/4-in. water line, buried 7 ft. deep, which fills a series of six 900-gal. tanks.

"It's like a regular well system," Heers says. "It runs on demand and has a pressure switch on a pressure tank. The solar panel runs a 1/2 hp motor."

He hopes to use the watering system until December when he moves his cattle off pasture. He'll shut the hydrants off and drain the lines.

He put down fabric, rock and poured a

cement pad to support the solar panel and protect the well area, which is fenced off from cattle. Altogether it cost about \$33,000 for the water line project. About half of that was subsidized by loans and grants through Environmental Quality Incentive Program (EQIP) and the Rural Energy for America Program (REAP).

Because he had to deal with flooding problems in the spring, the solar project didn't get finished until late summer. But Heers says it seems to be low maintenance. If the sun doesn't shine for a long period, he can hook up a generator to the pump as backup.

"Solar is quiet and clean," Heers says. "Long term it's the way to go. We don't know where electricity prices will go. We've got to get more off less land." He likes the idea of not paying monthly electric bills and is looking into putting in a solar panel to charge batteries for his electric fence.

The biggest benefit, he adds, is that water is closer to the feed, and his cows aren't walking off their weight gains.

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