

# On-Farm Incinerator Converts Manure To Electricity

Since December, 2005, Wiese Brothers Dairy near Greenleaf, Wis., has been burning the manure their cows produce and turning it into enough electricity to power about 700 homes.

At the same time, the system eliminates odor problems because of the aerobic nature of the process.

In burning the manure produced by their 1,600 cows and 1,300 heifers, farm owners Mark, Dave, Ken and Dick Wiese are able to sell the resulting electricity to a local power company.

According to Mark, it will take 8 to 10 years for the family to pay for the "biomass boiler" system that powers a turbine generator.

The "Elimanure®" system was patented by Skills Associates, a subsidiary of Kozlovsky Dairy Equipment in De Pere, Wis.

Inventor Wallace Lasonde says it improves water quality and cuts down on odor emissions and greenhouse gases.

"Our Elimanure System aerates the manure, which greatly reduces odor. There also isn't any need to store the manure in lagoons or spread it on the land," Lasonde explains. "Our system burns the manure at 2,000°F, which limits the amount of fumes that are able to escape. The steam that's created is then piped to a turbine."

The burning process is actually called "thermal gasification" — defined as "the thermal degradation of materials by heat in the presence of a limited amount of air or oxygen, producing a combustible gas. This gas can then be used in either boilers or combus-

tion turbine/generators."

It took four years from the time Lasonde got the idea before he had a signed agreement with his first client — the Wieses. Then, it took nine months to get their system up and running, he says.

Mark points out that the system is not yet operating at full capacity and he anticipates it will be another six months before the final phase is complete.

Due to a slow-down in equipment deliveries he's currently experiencing, Lasonde says new projects will take about one year to become operational.

Besides producing saleable electricity, the system generates excess steam that can be used to heat water or buildings.

The first stage of the system involves pumping raw manure from a liquid manure collection tank in the freestall barn, several hundred yards away, to the bioenergy facility which consists of two buildings joined by pipes and conveyors.

The bio-dryer is made up of a series of manifolds in a concrete pit covered with gravel. The pit holds about 200 tons of liquid manure.

"When you first start up, you use sawdust to mix with the 90 percent moisture manure to bring it down to 40 percent moisture, so that the boiler can burn it," Lasonde says. "As that first batch is burning, the boiler is making high pressure steam which goes into a turbine generator, and that's where the electricity comes from. Low pressure steam also comes out of the turbine and goes into a heat



Manure-burning boiler on Wiese Brothers Dairy drives a large electric generator. The extra electricity is sold to a local utility company.

exchanger where we heat ambient air. This hot air is used to dry the next batch of manure to be burned. From the second batch on, it's pure liquid manure with no additives."

After it has continued on through the thermal gasification process, only about two percent of the manure solids remain as ash. This material is a 0-8-10 compound, and can be land spread as a fertilizer. Wiese Brothers Dairy sells the electricity they produce through a confidential agreement with Wisconsin Public Service Corporation.

This system was designed to support dairy,

beef, hog and poultry operations.

"We also have a system called Elimiwaste that's used to eliminate waste streams in food manufacturing plants and ethanol plants," Lasonde says. "Because ethanol has a much higher btu than manure, it works even better there, and can reduce the cost of ethanol production by 30 to 35 cents per gallon."

Contact: FARM SHOW Followup, Skill Associates, Wally Lasonde, P.E. W712 County Rd. UU, Kaukauna, Wis. 54130 (ph 920-371-0133; wrlasonde@aol.com; www.burnmanure.com).



Bauer designed a tilting lift mechanism mounted on 2-in. spindles on back of cart.



Working with Mark Bauer, Don Bicknese converted his Rawson planter cart into an 8-row Soil Warrior zone tillage machine.

by Loren Manthey

## Farmer Converts Rawson Planter Cart To Soil Warrior Zone Tillage Machine

Looking for a different attachment that would do a better job of applying fertilizer with his corn planter, Don Bicknese of Chatfield, Minnesota stumbled onto a completely different idea. In a matter of months it has changed his tillage practices prior to corn and soybean planting.

"I heard about Mark Bauer near Faribault, Minn., who had a spring-loaded applicator and went to check it out last fall," says Bicknese. "When I got to Bauer's farm, we talked about the applicator and I placed an order. But I also found out that he had built a whole new zone tillage machine called the Soil Warrior (featured in FARM SHOW's Vol. 30, No. 2). He showed me the machine and several corn stalk fields with nice looking zones, and I was very impressed. It really got me thinking about how I could improve my no-till planting operation."

Within a couple hours, Bicknese was making arrangements with Bauer to convert his Rawson planter cart to an 8-row Soil Warrior zone tillage machine. "We initially

thought we could just remove the coulters from the front of the cart and mount a Soil Warrior bar and row units on the 3-pt. planter hitch," Bicknese said, "but the Soil Warrior bar needed positive down pressure and more lift clearance."

To meet those requirements, Bauer designed a tilting lift mechanism mounted on 2-in. spindles on the back of the cart. Two 2 1/2 by 5-in. channel iron supports mount under the main frame and connect to the front of the cart. Each channel holds 3-in. cylinders with a 20-in. throw. As the cylinders extend, the 7 by 7-in. by 20-ft. Soil Warrior bar is tilted up on the pivot spindles. Row units lift out of the ground with 18 in. of clearance. When the cylinders are closed, the bar locks tight so that weight from the fertilizer box can be transferred to the row units through the force of the air bags.

The air bags act as pneumatic springs to create positive down pressure to each of the Soil Warrior row units. Pressure is supplied by a portable Ingersoll air compressor

mounted on the cart frame. A dial in the tractor cab allows easy adjustments to increase or decrease down pressure as field conditions warrant.

"This machine is just amazingly simple to operate," says Bicknese. "We went across more than two thousand acres of corn stalks and bean stubble this spring on my farm and for some neighbors. Each row unit operates independently with positive depth control and positive down pressure. We incorporated dry fertilizer in zones about 4 to 5 inches deep and 10 to 12 inches wide. We followed the machine with our twin row planter anywhere from four hours to a day after zone tillage and the planting conditions were ideal. The soil in that zone warmed up probably 10 to 15 degrees prior to planting, and I think that really helped speed up germination."

Another feature that Bicknese really appreciates is the ability to quickly start and stop the fertilizer drive. Bauer adapted a 3-in. air spring to the wheel drive system with a switch in the tractor cab that raises and lowers the

wheel to stop and start the drive. Says Bicknese, "I can easily do comparison tests with and without fertilizer without leaving the tractor."

"I still consider myself a no-till farmer with the Soil Warrior," says Bicknese, "and the Rawson cart, which worked well in the past, has remained intact. I'm just working about one third of the ground and applying fertilizer in the fall, and working those same zones in the spring before planting. I'm conserving moisture, leaving residue in place to control erosion and creating an ideal seedbed for young plants."

Contact: FARM SHOW Followup, Don Bicknese, 18012 County Road 110 S.E., Chatfield, Minn. 55923 (507 951-3599) or Mark Bauer, Environmental Tillage Systems, 16936 Cannon City Blvd., Faribault, Minn. 55021 (office 507 645-2268 or cell 507 330-1049; ETSI@myclearwave.net; www.soilwarrior.com).