OWNERS AIM TO BE ENTIRELY SELF-SUFFICIENT FOR FARM'S ELECTRICAL NEEDS

Dairy Farm Turns Cow Manure Into Electricity

by Elaine Klinger

Adams County, Penn., known nationally for its historic Gettysburg battlefield, is once again making history. Southeast of Gettysburg at Mason Dixon Dairy is a Plug-Flow Digester which has been producing "Bio-Gas" — 60% methane, 32% carbon dioxide, and 6% other ingredients — an organic fuel used in the production of electricity. And electricity production is the name of the game at Mason Dixon Dairy, owned and operated by the Waybright family of Gettysburg.

Eight years ago, the Waybrights began their search for a way to make the best use of all the resources on their farm — including the manure produced by their large dairy herd. At the present time they are milking just under 700 head of Holstein cows with a herd average of around 13,000 lbs. per cow. After much studying and searching, an agreement was reached with Scheaffer-Roland of Chicago to engineer the construction of a Plug-Flow Digester which could extract "Bio-Gas" from cow manure.

To date, the technology surrounding "Bio-Gas" production and use is still in an experimental stage. Richard Waybright related that their digester was constructed on a very experimental basis, with as little initial investment as possible until the project appeared feasible. Even at this, the total cost of this "experimental" electrical power source was $85,000.

The Plug-Flow Digester works by keeping 12 percent solid, slurry cow manure heated to a minimum temperature of 95 degrees for a period of 15 days. The digester, which looks like a large, long black balloon, can hold 195,000 gallons of manure. Each day 13,000 gallons of fresh manure are pumped into the digester, and 13,000 gallons of spent manure are removed. A heat exchanger, operating in conjunction with the generator, is used to heat the manure. Heat pipes running the length of the center of the digester cause the manure to rise and move towards the outside of the digester. This forces the manure on the outside to move along the bottom of the digester towards the center, and the heat pipes. Thus, a continuous motion is maintained, and the bacterial action promoting the formation of "Bio-Gas" occurs. At present, one million, two hundred thousand cubic feet of "Bio-Gas" are being produced monthly.

There are two interesting by-products of the production of "Bio-Gas". One is the production of a 40% washed solid material suitable for use as bedding in free stall barns. The bedding is a result of squeezing the liquid out of the manure removed from the digester. The material is free of pathogenic bacteria, practically odorless since the ammonium nitrate has been stabilized, and spongy, which keeps it underfoot longer. The second by-product is the liquid squeezed from the solids. This liquid emerges as a neutralized fertilizer containing a higher concentration of nitrogen, phosphorus, and potash than fresh cow manure.

At this time only a portion of the available manure can be processed through the digester. However, if the new system continues to operate on its current level or better, there are projected plans for the construction of another digester which will be able to process the remaining manure available from Waybright's herd. When the second unit goes into operation Mason Dixon will be able to produce all the electricity they need, and then some!

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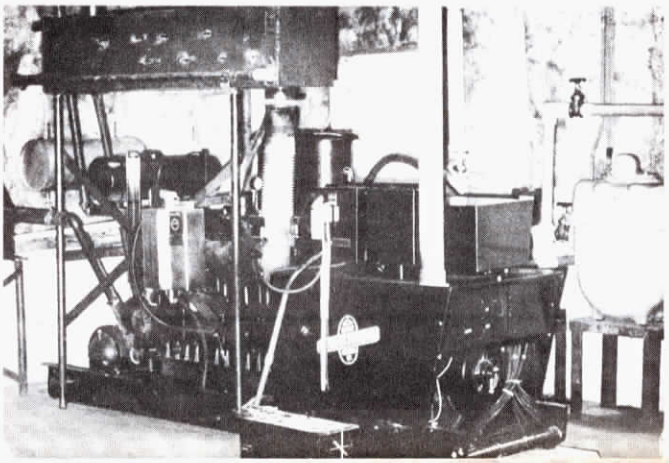
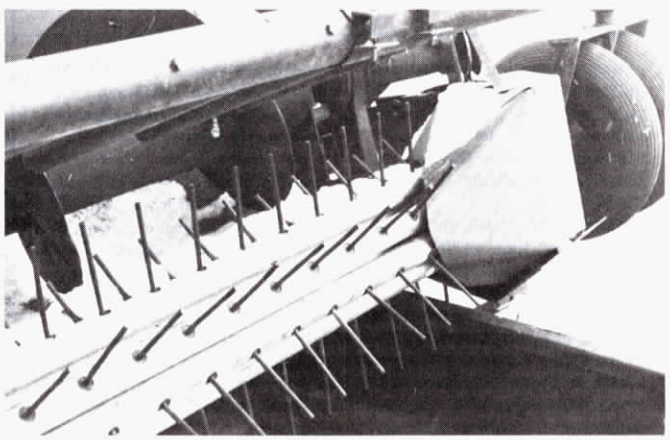


Methane produced from cow manure fuels a model 6-71 diesel which drives a Delco 125 KW generator. Alcohol-fueled diesel engine supplied by Stewart and Stevenson Services, Box 1637, Houston, Texas. It's the only firm we know of that sells large dual fuel (alcohol or diesel) engines.



The pickup's six tightly fitted steel bars move back and forth lengthwise, creating a "cross-over" finger action similar to that of a side-delivery rake.

CROSS-OVER FINGER ACTION OF PICKUP WORKS LIKE A SIDE DELIVERY RAKE

New-Style Header Gets Downed Grain

"Conventional grain headers are made for average conditions and that's how they work — average," says Dave Friesen, Winkler, Manitoba, who's developed a grain header specially designed to work in difficult crop conditions.

"You can't beat it for picking up short or rained-on swaths of grain which every grower has to deal with in bad years," points out Friesen. "The header's pick-up 'reel' actually consists of six tightly fitted steel bars, with mounted steel fingers, that move back and forth lengthwise, creating a 'cross-over' finger action similar to that of a side delivery rake. Since the machine is moving forward while the pick-up fingers are crossing over, it's almost impossible for any grain to slip through without being picked up by the fingers."

The pick-up is driven by an independent hydraulic orbit motor so speed can be varied according to conditions. "It's also unique in that the pick-up is attached directly to the header, eliminating all drapers and rollers between pick-up and header. The entire header floats, not just the pickup, as on most combine headers."

The header is totally self-contained, complete with hydraulic reservoir. Both the pick-up hydraulics, and pulleys used to drive the feeder auger, are driven off one shaft, which runs through the feeder house.

The first two models just going into production will have 115 and 132 in. of net pick-up and will fit all combines with quick-attach headers. Plastic fingers are optional.

For more information, contact: FARM SHOW Followup, Dave Friesen, Reeper Design, Ltd., Rt. 3, Box 6, Winkler, Man., Canada ROG 2XO (ph 204 325-9756).