

# Waybright digester

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west to pump irrigation waters from deepwater wells.

"An LP motor is much more efficient than a diesel," affirms Waybright. "Timing on them for our use needs to be advanced about 21 degrees, which is virtually impossible on a diesel."

The diesels also required one-tenth diesel fuel, added to the biogas, while the LP generator runs solely on unscrubbed biogas piped straight out of the digester.

Efficiency with the LP's has jumped from about a 12 percent of the BTU utilization, obtained from the previous diesels, to as high as 33 percent efficiency with an 80-percent load on the LP system.

"We don't have all the answers yet, but we are getting a better handle on it," he adds.

In addition to generating electricity to operate the milking parlor, cooling and processing of milk, farm shops, and powering four homes, plus an electric-irrigation system motor scheduled for installation in the spring, a heat exchanger utilizes waste heat from the generating motors to heat water to 180 degrees for dairy use, and hot water heating systems.

Still another side-benefit of the system, one that Waybright says he's really excited about, is the increased value of the manure that has gone through the digester process.

After two years of working with the digested wastes, Waybright says that the digested manure is worth six times the value of freshly-spread waste. As the manure passes through the digester heating and gas-production process, the available nitrogen is converted from the ammonia-type that breaks down quickly in the soil to a more stable nitrate form.

Some of the valuable manure water is pumped through four pivot irrigation units over 500 of the farm's total 2765 acres. Test plots checked in the irrigated areas show virtually no difference in yield between crops treated with manure water spray and plots boosted with commercial fertilizer.

"We've seen no burning on the leaves of alfalfa or corn. They just seem a little darker green," Waybright relates.

He noted one particular wheat field, planted last fall, and treated with three-fourths inch of the manure water. Mason-Dixon chopped that growth in April, at waist-height, and in Waybright's words, "thicker'n the hair on a dog" and lodging.

In May, a second growth was chopped before the ground was planted to corn. The silage taken off the same field later in the summer yielded 25 tons per acre. No added nitrogen had been applied to either the wheat or the corn crop.

Digested manure also shows promise to cut down on the need for frequent liming of soils. The normal acidity of manure, about a pH of 7, drops to 4.5 after soil application. However, after being run through the biogas process, the pH of the manure climbs to 7.3-7.5.

"It's also a labor saving device, since we don't spend days repairing spreaders and hauling out manure," Waybright adds.

And still another labor savings has come from eliminating the need to bale and handle straw for bedding.

As the digested manure exits the biogas production units, it is run through a "squeezer", a device somewhat akin to an old-fashioned wringer washer. Water is squeezed from the slurry, and reclaimed to

the recycling system for flushing and irrigation, leaving the remaining, nearly odorless, cellulose solids.

Again, waste heat from the manure-to-electricity system is used to dry those solids, which have proven an excellent bedding material for livestock, and a superb soil organic booster for gardens.

"A digester is the proper way to handle wastes, and still be cost effective," Waybright insists. He stresses that a family-size herd of about 50 cows could theoretically generate the energy equivalent of 18 gallons of diesel per day, or 6,500 gallons a year.

And, utilizing the waste heat produced by generators, through a heat exchanger for water, could be worth the equivalent of still another 2,100 gallons of diesel.

"When farmers recognize the true potential," he predicts, "I'm convinced that any livestock farmer is going to have a digester. It's a pretty good payoff."

He also lent a warning: "Don't spend a penny until you know how you'll adapt to this new concept."

Two representatives of Metropolitan-Edison in York were on hand at the energy seminar to discuss the Residential Conservation Service Program, and an experimental program on time-of-day rate differentials.

Time-of-day rates are currently available only to residences, not farm use, nor to farm homes hooked into the same meter as the barn.

The concept is aimed at encouraging the use of electricity in private homes at times when it is not in peak demand for the running of business and industry.

Two rates apply in time-of-day metering. Electric used from 8 a.m. through 8 p.m., Monday through Friday, is charged at the rate of 7.1 cents per kilowatt. For all other hours, including all day

Saturday and Sunday, the charge drops to 2.8 cents per kilowatt. That compares to normal across-the-board rates of over 5 cents per kilowatt.

Users of the new, experimental program, are further encouraged to cut their heaviest use, generally from the home hot water heater, by installing a timer to run that major appliance during off-peak hours.

Studies of the time-of-day concept show a potential savings to homeowners of up to 12 percent.

A special meter is installed for the two-cost type of service and

customers signing up for the program must agree to continue for one year. While there is no minimum consumption level, usage under 700 kwh per month is not considered cost effective enough to make the switch.

Met-Ed representatives, admitting there was no farm expertise on their staff, projected that, in the future, farmers might get their best energy buys with biogas-from-manure, production for peak-hour use, and the purchase of commercial electricity during off-peak hours.

## Co. ranks 14th in ag products sales

WASHINGTON, D.C. — In a report released this week by the U.S. Department of Commerce, Lancaster County has moved up four notches on the national list of Leading Counties in Value of Agricultural Products Sold.

According to the report, Lancaster County now ranks fourteenth with its \$405,527,000 worth of farm products sold. This figure was based on the 1978 Census Bureau report. In the previous report of 1974, Lancaster ranked eighteenth in the nation.

The only other Pennsylvania county listed in the top 100 counties in the nation is Chester county, with \$172,582,000 worth of farm product sales. The neighboring county has climbed fifty incredible notches on the survey and now ranks fiftieth — the 1974 census found Chester County squeezing onto the list of top 100 counties in last place.

Fresno, Calif. was again the top-ranking county in value of all farm products sold, according to data

compiled from the 1978 Census of Agriculture by the Commerce Department's Census Bureau. Weld, Colo., was ranked second and Kern, Calif., third.

Fresno's farm product sales figure was \$1.023 billion in 1978, the only county to attain the billion dollar mark. Weld's total was \$817.7 million, up from \$601.3 million in 1974, and Kern's at \$716.5 million was up from \$570.2 million in 1974.

The top 10 counties had total sales of \$6.3 billion, about 6 percent of the nation's \$108.1 billion sales. Others among the top 10 were: Imperial, Calif., \$651 million; Tulare, Calif., \$648 million; Monterey, Calif., \$581 million; Maricopa, Ariz., \$539 million; Palm Beach, Fla., \$494 million; Merced, Calif., \$460 million; Riverside, Calif., \$457.6 million.

Twenty-one of the 100 leading counties in 1978 were in California; 13 in Texas; 9 in Iowa; 8 in Illinois; 7 in Kansas; and 6 in Florida.

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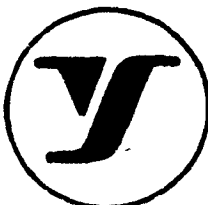


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