York agri-business seminar explores energy

BY JOYCE BUPP
Staff Correspondent

YORK — Looking for a quick way to reduce our total national fuel dependency by three percent?

"Then stop producing food," says Joe McCurdy, agriculture engineer with Penn State's ag college. McCurdy headed up a panel of speakers on energy innovations at the York Agri-Business seminar held last Thursday at Avalong Farms Restaurant.

While non-farmers tend to label big harvest machines and large horsepower tractors as high energy consumers, statistics disclaim those myths. Although the total food industry uses 16.5 percent of the nation's fuels, actual on-farm production takes only three percent of the nation's total needs.

Just preparation and cooking of America's meals uses a bigger chunk and transportation and marketing account for even more.

Pennsylvania agriculture is almost totally petroleum based, including the running of some on-farm electric generators. Fertilizers and chemicals account for the biggest use. Corn production is the largest crop user of energy, with alfalfa and hay production in the second spot.

One farmer on the panel is making farm energy history by turning his dairy farm waste into the energy to produce milk. He's Horace Waybright, operator of Mason-Dixon Dairy in Adams County, where a unique system is converting manure from 800 milking cows into generator fuel

"It's efficient and simple," Waybright attests. "And it helps to control odors." He estimated a hundred thousand dollars is invested in the system, which has been in operation for two thousand hours.

Manure is flushed and pumped into a huge plastic bag digester and kept heated to 95 degrees through heat exchanger pipes. The methane produced by the warmed manure is drawn off, blended with a small amount of diesel for ignition and engine lubrication, and used to run a diesel engine that operates the electric generator to power milking equipment.

Wastes pumped from the bag are run through a "squeezer", which separates nutrient-high fluids for field irrigation from dried solids suitable for cattle bedding. Waybright projects the system will pay for itself in five years or less. For the full story, see page one

Wind power is frequently mentioned as another energy alternative. Panelist Robert Johnson is a research engineer with Pennsylvania Power and Light, which has a wind turbine operating a few miles west of Hazelton.

The machine, in operation since September of 1978, is four-bladed with a horizontal axis. A medium-size machine, it's geared toward the needs of residential or small commercial customers.

"It has very, very good mechanical reliability, but we're disappointed with the output," Johnson admitted. That output to date has been only two percent of the turbine's potential capacity.

Site of the machine, he warns, is of prime importance in locating a wind turbine. At least one full year's wind data should be accumulated before finally setting up a wind turbine system.

Cost of the turbine will be prohibitive to the average home owners or small business, though. Projected cost for one is estimated at $30,000 to $50,000, with PP&L investing $230,000 in the Hazelton experiment.

Solar energy, popular winner in alternative energy polls, will continue to be worthy of a lot of talk but limited action believes E. Randal Beck, of the York County Planning Commission.

The cost effectiveness of solar is not practical for wide commercial use, with Beck citing estimates of nine thousand football field size solar collectors needed to replace the energy generated by the inoperable Three Mile Island nuclear plant.

Most effective use of solar in agriculture, he figures, is incorporating it in new facilities for livestock housing, or the farm house itself.

Stone storage is the simplest and cheapest method of solar heat retention; but the stones must be spotlessly clean and totally dry, or mold, moisture and eventually odor problems may arise.

"Now they can stand here and say it can't be done — but I've seen it done," argued Richard Potts, Fulton County farmer and alcohol distilling enthusiast. Potts spoke on the controversial procedure now earning praise from supporters, while being viewed by many specialists as impractical.

Most of the information being put out on alcohol pertains to beverage-types, claims Potts, and that's not applicable to fuel distillate.

He's building two prototypes for alcohol production, one at Wilson College in a research study and another a cutaway demonstrator. Potts said any patents that come out of the Wilson College experiment will be turned over for use by the public.

"Use your junkyard," he urged farmers interested in trying alcohol distilling

He warned, though, that all components must be "dairy-house clean," and estimated 20 gallons per hour as a reasonable rate of production, with costs ranging from 42 to 90 cents per gallon depending on the operation's efficiency.

A researcher from the Northeast Solar Energy Center called the panelists' topics "the four big candidates for renewable energy in agriculture." About 160 million gallons of gasoline or its equivalent were used to farm in Pennsylvania last year.

William Locheretz, Ph.D. and senior agriculture scientist at the Center, then shot down the likelihood that any of the alternates will large replace current petroleum based fuels.

Alcohol, the most likely suitable, requires corn which is already in demand and higher priced in the East than in the grain-glutted Midwest.

Methane does not adapt readily to mobile systems, although it has proven uses in building facilities, where low-temperature heat is required.

Wind and solar are both dependent on weather conditions and thus must be backed up with more secure and reliable energy sources

Instead, Lockeretz sees the four renewables more as "energy insurance" than complete substitutes, systems that can be utilized as long as they have a backup method.

He opinioned, "Farmers can do a lot of innovation and respond to the challenge of energy do-it-yourself systems better than the average home owners."

William Locheretz told York farmers that current energy alternates will not replace petroleum fuels.

Makes It Easier

When Thomas Hart Benson's house in Washington was burned, Benson left Congress and came to the ruin of his house As he looked at it, he said, "It makes dying easier There is so much less to leave "