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TECH HELPS DAIRY FARM
APPROACH ENERGY INDEPENDENCE

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ATLANTA, GA -- Cows offer the world an array of useful products and the list may soon include electricity.

With the backing of the Department of Energy (DOE), Georgia Tech is using the wastes of cattle to generate electric power and heat on a farm near Atlanta.

Late this summer, Tech engineers will go on line at the Mathis/P&M Dairy Farm near Social Circle with an integrated system which helps this operation approach energy independence.

"The interesting feature of the project isn't any of the energy technologies we're using because most of them are well known," says project engineer Chuck Ross of Georgia Tech. "What's innovative is the way the system is put together."

This program began during the Carter Administration and was one of the few energy demonstration research projects to weather federal budget cuts after President Reagan's election. DOE is providing half of the funding for the $876,000 project. The remainder -- except for around $50,000 provided by Mathis/P&M Farm itself -- comes from the State of Georgia through Georgia Tech's agricultural research program.

The heart of the system is an anaerobic digestion unit, which takes manure from the farm's 550 cow herd and ferments it into a mixture of gases capable of substituting for natural or liquid propane gases. This product, known as biogas, fuels an engine which generates electric power for many farm operations.

A special attachment recovers waste heat from the generator's cooling and exhaust systems, using it to provide hot water and space heating in the milking parlor and to keep the anaerobic digester at a steady temperature of 100° F.

Anaerobic digestion reduces the volume of manure only slightly and system operators must dispose of the wastes left in the tank in an environmentally acceptable way. Luckily, the digestion process also helps reduce the pollutant level in animal manure, yet it still retains its potential as an organic fertilizer.

Mathis/P&M Farm will separate solids from liquids in the digested manure, using the former to replace sawdust as bedding material for the dairy herd. The remainder of these wastes will be deposited in fields where corn and sorghum silage is grown as food for the herd.

Georgia Tech's involvement goes beyond the anaerobic digestion system. Research engineers also are studying the effectiveness of minimum tillage of soil in the corn and sorghum fields. Conventional tillage practices call for these fields to be passed over four or five times before planting. Farmers using minimum tillage plow land and seed it during the same pass over the field. Tech will conduct research on the effectiveness of

this practice and, if it works, collect data on the energy, time and soil it saves.

The research project also will focus on water conservation. Excess consumption at the dairy has increased electricity needed to pump water from the ground and onto the fields. Georgia Tech is looking at methods for reducing water leakage around the dairy and cutting back on water needed to flush manure from dairy barns.

Despite the efficiencies promised by this interlocking approach, Ross cautions that the energy system at Mathis/P&M Farm will require development to be cost effective.

"This is a research project and we're trying to build the knowledge necessary to reduce the expense of this system to acceptable levels," he says. "If a farmer asked me if he should go out today and build one of these systems, I'd have to tell him no. But the tractor wasn't cost-effective either when it was first developed. So it may be that by the year 2000 every dairy farm will operate this way."

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