

IN AN EFFORT TO TRIM energy costs and waste production, the Fairview Swiss Cheese Plant in Fredonia, Pa., is implementing a new anaerobic treatment system to process whey—a by-product of the cheese-making process.

“The system generates 2.3 million kilowatt hours per year of electricity and offsets about \$400,000 per year in energy and waste disposal costs when electric rate caps are removed,” said Tom Wilson, Penn State Cooperative Extension educator in Crawford County, who helped Fairview develop the system.

Whey can be applied to farm fields as a fertilizer; however, the need to spread it on fields throughout the year (even during the winter when plants



CHEESE PLANT CUTS OUT THE FAT

are not growing), as well as an increasing cost of disposal, called for an alternative solution.

Fairview’s anaerobic digestion system—partially funded by the U.S. Department of Agriculture and the Pennsylvania Department of Environmental Protection—relies on bacteria to break down the liquid whey. The oxygen that is created is converted into a gas that can be used to produce energy.

The cheese company also is planning to process rinse water from the nearby Joy Cone Company, an ice cream cone manufacturer whose most expensive waste product is rinse water containing high amounts of sugar. The digester will process 50,000 gallons of waste per day from the two companies combined.

“The anaerobic digestion system is an innovative solution to an environmental and economic problem,” said Wilson.

SEEING THE FOREST *for More Than the Trees*



Courtesy of Shaver's Creek Environmental Center

WHILE THE DISCOVERY of a patch of morel mushrooms on a forest floor is enough to send the gourmands among us into a fit of epicurean ecstasy, to a property owner educated about the benefits of nontimber forest products, the find also conjures visions of dollar signs. That’s because the delicacies can fetch up to \$50 per pound. And morels aren’t the only valuable nontimber product to be found in Pennsylvania’s forests. American wild ginseng, for example, brings more than \$1,000 per pound.

“I see tremendous economic opportunity for Pennsylvanians to engage in various nontimber forest product industries,” said Eric Burkhart, instructor and program director at Penn State Shaver’s Creek Environmental Center, a unit of Outreach. Burkhart is leading an effort that aims to educate Pennsylvania forestland owners about the benefits of growing and selling nontimber forest products—such as American ginseng, goldenseal, mushrooms, maple syrup and wild leeks—in workshops throughout the state.

Because some of these products are rare—American ginseng populations have suffered from overharvesting—Burkhart stresses to landowners the importance of conservation and growing ginseng in a sustainable way.

“I believe that everyone should do their part to conserve these resources through active planting, tending and harvesting,” he said.

Dr. Michael Jacobson, Penn State associate professor of forest resources, collaborates with Burkhart and also leads efforts to promote nontimber forest products in other countries, including South Africa, Bangladesh and Mozambique.

Morel mushrooms can fetch up to \$50 a pound.



Good compost needs a balanced "diet."

TURNING GARBAGE INTO GOLD

KITCHEN AND YARD WASTES comprise 30 percent of the garbage Pennsylvanians throw away each week. According to Dr. Richard Stehouwer, associate professor in Penn State's Department of Crop and Soil Sciences, "These food and yard wastes are valuable materials that can replace store-bought garden fertilizer."

Since 2000, Stehouwer has been coordinating a program, funded by the Pennsylvania Department of Environmental Protection and taught by Penn State Cooperative Extension, for Pennsylvanians to learn how to transform their organic wastes into compost. In 2007, 93 percent of workshop participants who completed a survey said that they either are composting or plan to compost more organic materials than they had before they attended the workshop.

So far, the program has:

- ▶ Held more than 1,700 workshops
- ▶ Reached 50,000 households
- ▶ Distributed more than 55,000 compost bins



Dr. Sjoerd Duiker (center)

PLEASE DON'T TILL THE SOIL

TILLING SOIL IS AN AGE-OLD farming activity, yet it is fast becoming a thing of the past. The Crop Management Extension Group at Penn State is contributing to this change by educating farmers throughout the state on the benefits of no-till crop production.

"Soil tillage requires well over half of the engine power expended on American farms," said Dr. Sjoerd Duiker, Penn State associate professor of soil management and applied soil physics and a member of the Crop Management Extension Group. "No-till methods reduce the use of fossil fuels, they save farmers' time, and they make it possible

for farmers to use the land more intensively. No-till methods also reduce soil erosion and the loss of organic matter, and they help to save soil moisture."

Duiker has led many workshops on no-till farming methods, including two workshops for Amish farmers in Lancaster County. "The Amish are now adopting no-till methods very fast," he said.

He has also collaborated with the Centre County Conservation District, Centre County Cooperative Extension and crop consultants on a project to assist farmers in one aspect of no-till farming: growing legume cover crops prior to corn crops to replenish soil nitrogen.

"Nitrogen fertilizer is responsible for about 30 percent of the fossil energy use in U.S. crop production," he said. "So if legumes supply that nitrogen to the next crop that will be grown, we can make another significant dent in the amount of fossil energy that is used. Nitrogen fertilizer also has become much more expensive, so leguminous cover crops are economically attractive for farmers."