Penn State plant scientist looks at peat for fuel

UNIVERSITY PARK — Peat bogs of the U.S. offer a source of energy that Europeans find competitive on a cost basis with other fossil fuels such as coal and natural gas.

This "young coal," as peat is often called, has been studied as an alternate to fossil fuels by John W. White of the Agricultural Experiment Station at Penn State. A plant scientist, he became involved with energy alternatives while testing and developing insulating materials for greenhouses.

"Russia exports oil, gas, and coal, and has no scarcity of these resources. At the same time, the Russians operate about 76 peat-fired electric power generating plants," White said recently.

"We can assume that using peat in Russian power plants must be more economical than bringing coal, oil, or gas into the areas of peat deposits," he commented.

Although virtually unexploited for power in the U.S., peat is the second largest source of energy in the nation, White noted. He claimed peat is used widely to generate electricity in Finland and Ireland, as well as Russia.

White has been recognized at Penn State for his ability to explore new areas of research. He serves a dual role as professor of Floriculture and as associate director of the Office of Industrial Research and Innovation.

Peat is found throughout the U.S., it was noted, but the largest supplies exist in Alaska (outside of the permafrost regions), Minnesota, Michigan, Florida, Wisconsin, Louisiana, North Carolina, Maine, and New York.

"Many of the peat-rich states have no significant supplies of other fossil fuels," White observed, adding that "countries such as Finland, Sweden, and Iceland have no other fossil fuels."

In its natural state, peat contains about 90 percent water. The water content can be reduced to 50 percent or less by drying peat for a few days. Peat harvested for power generation in Russia, Finland, and Iceland is burned at 35 to 55 percent moisture content.

Experiments are underway to use peat as fuel in the U.S. A study made for First Colony Farms of Creswell, North Carolina, examined large-scale peat harvesting for power generation. The results showed that it is technically and economically profitable to produce peat for fuel at 35 to 50 percent moisture with air drying.

White said the peat bogs of the U.S. contain some 53 million acres of this product. World peat resources are estimated to exceed the energy equivalent of 1800 billion barrels of oil.

Burning this fuel would not destroy peat sources used widely in the U.S. as soil conditioners in the field of horticulture. Peat is of three types, it was explained, and the kind used to improve soil—fibric peats formed from spagnum and other mosses—is not suited for fuel.

The most burnable type is hemic peat—formed from reeds, sedges, swamp plants, and trees. Such peat has a higher heating value than fibric peat. The third type is sapric peat. Thoroughly decomposed, sapric peat burns poorly in generating power.

The Penn State scientist cautions large-scale use of peat for fuel should be evaluated first for its effect upon the environment, as with development of any alternative energy source. For example, the harvesting plan should include control of surface and groundwater flow throughout a project area.

"Peatlands are wetlands. It may be desirable to preserve and protect such wetlands to preserve certain unique biological species," he stated, adding that "work must be done to identify such areas."

On the other hand, large-scale use of peat can improve productivity of land. Relatively few of the peatlands in the U.S. are productive today except for removing peat. Harvested peatlands can be used to grow some crops, Dr. White said, or can become wildlife habitats, lakes, ponds, and energy farms.

In Europe and Canada, harvested peatlands have been used successfully for farming. First Colony Farms in Creswell, North Carolina, mentioned earlier, have reclaimed harvested peatlands for agricultural uses.