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NRRI STUDIES NEW USE FOR PEAT

Duluth -- The Natural Resources Research Institute (NRRI) is looking at a possible new use for Minnesota's peat resources.

Under a \$6000 grant from the Minnesota Department of Energy and Economic Development's Office of Alternative Energy Engineering, the NRRI will investigate the feasibility of biologically converting peat to useful polysaccharides.

"These polysaccharides, or starches, could be the feedstock for a number of industrial processes, including ethanol," points out H. Eugene Shull, NRRI associate director for energy.

The bioconversion experiments and analyses will be conducted at Bemidji State University under the supervision of Steven A. Spigarelli, Director of the Center for Environmental Studies. Spigarelli is under contract to the NRRI for the project. The NRRI will also supply some of the necessary laboratory equipment.

Peat normally contains variable amounts of cellulose and lignin -- materials not easily biodegradable under current chemical or biological techniques. But bioconversion of these materials may be possible with the use of a mixed-culture technique incorporating cellulose- and lignin-degrading bacteria and fungi with protozoa that synthesize and store the

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polysaccharide conversion products.

In the experiments, two or three species of cellulose-degrading protozoa will be cultured on sterilized peats from Minnesota. To enhance the bioconversion of cellulose and lignin to starches, selected bacteria or fungi will be precultured on the peat. Protozoan cultures will be inoculated several days later.

The test will enable investigators to determine the polysaccharide producing capacity of various protozoa. Those best able to produce polysaccharides will be selected out for further testing.

Once the protozoa have been selected, tests will focus on what nutritional media will encourage the most rapid bioconversion.

The last experiment will test for optimum combinations of organisms, substrates, nutrients, and environmental conditions necessary to produce maximum yields of polysaccharides by protozoans.

Investigators estimate that the total evaluation process will take six months.

The Natural Resources Research Institute was established in July, 1983. Its mission is to create private-sector employment in Minnesota through development of the state's natural resources in an environmentally-sound manner.