

Manitoba researchers convert cattails into pellets

By Anna Austin | March 08, 2011

University of Manitoba researchers, while working on a project to restore health to Canada's Lake Winnipeg, discovered that turning the lake's massive quantity of cattails into fuel pellets is an efficient way to keep unwanted nutrients out of the lake and produce a renewable, clean-burning, energy-dense fuel.

Lead researcher Richard Grosshans said the project was initiated to determine the impact that harvesting sedge, a plant found in marshes, from Lake Winnipeg's Netley Marsh would have on excessive nutrient levels in the lake. The Netley Marsh filters the water that flows into the lake from the Red River, which is its primary source of nutrients.

In particular, the researchers wanted to find out how much phosphorous could be permanently removed from Lake Winnipeg by harvesting marsh grasses. "We ended up mostly focusing on cattails, because it is pretty effective as a wastewater treatment plant," Grosshans said. "Our cattails were loaded with phosphorous, which is one of the things we're interested in taking out of the marsh, and they have a really high energy value."

Some nutrients, such as nitrogen, are cycled in a wetland; they are stored and naturally broken down over time, Grosshans pointed out. "That's not the case with phosphorus, as it's all stored in sediments," he said. "Over time it can accumulate to the point where the wetland is completely saturated and can't store any more phosphorous."

When the project began four years ago, the researchers were focusing on turning the cattails into bales to be used in a gasifier, Grosshans said. About halfway through the project, power utility Manitoba Hydro expressed interest in using densified fuel made from the material, and provided the researchers with funding to investigate that possibility.

Cattail cubes were tried initially, but pellets turned out to be the best option. "We had trials with and without binders and found that the pellets with no binder had the exact same durability," Grosshans said. "It compresses and binds really nice in standard pellet equipment." The cattail pellets also have about the same calorific value as standard wood pellets, according to tests done by the Alberta Research Council.

Because of the pellets' high ash content, however, Grosshans said the material would work best when made into mixed fuel pellets. The researchers are currently working with a mixed fuel pellet manufacturer to test results on a commercial scale.

Sustainability of cattails shouldn't be a problem when harvested correctly, according to Grosshans. "They are extremely competitive and resilient and as long as you leave stubble above the water so the plant can breathe, it'll grow back," he said. "We're getting about 14 to 19 tons of biomass per hectare (2.47 acres), with 90 days to plant maturity."



Researchers at the University of Manitoba have discovered a way to use cattails to improve the health of Lake Winnipeg and produce a renewable fuel.

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