

## Two experimental drainage sites provide invaluable information

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DODGE CENTER, Minn. — Two Dodge County farm fields are test sites for innovative new drainage practices in Minnesota.

At the Ed Smith site in Ellington Township, a woodchip bioreactor was installed in September 2007. A controlled drainage experiment began at the John Kruger site in Hayfield Township in spring 2007.

Research at both sites was discussed at a meeting earlier this month at the Dodge County USDA Service Center in Dodge Center.

At the Smith site, the woodchip bioreactor is four feet deep and 270 feet long. The trench is 10 feet long for every acre they are trying to treat, said Jim Hruska, Dodge County Soil and Water Conservation District technician. They are trying to treat 26 to 28 acres.

A tile line comes into the trench for 10 feet to 15 feet on both ends, Hruska said. There is no tile in the middle of the bioreactor. The wood chips are four to five feet deep with dirt on top.

If there is too much water, it bypasses the bioreactor and goes through existing tile, Hruska said.

From March til mid-July 2009, two thirds of the water was treated and one-third bypassed the bioreactor, said Andry Ranaivoson, a research associate in the University of Minnesota Department of Soil, Water and Climate. The water that went through the bioreactor had reduced levels of ortho phosphorus, nitrate, nitrite and total phosphorus, Ranaivoson said.

It cost \$19,900 to install the bioreactor, Hruska said. It was funded by the Zumbro River Watershed.

The Smith site is in the Milliken Creek Watershed of the Zumbro River Watershed. Additional funding was provided by a Conservation Innovation Grant, Legislative Citizens Commission on Minnesota Resources and most recently by funds from the 3/8ths amendment passed by voters, said Mark Dittrich, Minnesota Department of Agriculture senior planner in conservation drainage. Ellingson Companies provided in-kind support as did Prinsco.

The project has funding to continue through the 2011 growing season, Dittrich said.

Customers are curious about controlled drainage, said Mike Tveten, southeast Minnesota survey manager for Ellingson Companies. They want to know if they can use it to get more from the land they own. Ellingson installed the bioreactor at the Smith site and the controlled drainage structure at the Kruger site.

It was tough to install the bioreactor at the Smith site, Tveten said, but he's been impressed with how it's working.

Both practices are in the research phase and Ellingson is involved to stay on top of what is coming in drainage, Tveten said. ADMC, MDA and the U of M are doing an excellent job of educating farmers about what they are doing in the area of drainage research, he said.

They have several research sites across the state where data is being collected. The results from the Smith site have resulted in more research there. This year, Ranaivoson will put bugs into the bioreactor to see if they eat atrazine and acetochlor. The bioreactor is similar to those used to control odor from hog barns.

Ranaivoson is breaking ground in both the physical and biological analysis for bioreactors, Dittrich said.

Hanging over the research is a statement made by an individual from Washington, D.C., at a Agricultural Drainage Management System Task Force meeting in St. Louis earlier this month.

The individual said that under the Clean Water Act there is a likelihood that the Environmental Protection Agency might classify agricultural drainage as a point source of pollution, said Leonard Binstock of the Agricultural Drainage Management Coalition. Currently, any point source discharge requires a permit to discharge into an impaired watershed, he said. Tile outlets are now considered non-point sources of pollution. The discussion that followed afterward was how do members of the task force move forward, Dittrich said. Many said the research of today will help if the country moves to the point where tile outlets are classified as point sources of pollution. The statement was an eye opener, he said.

But it doesn't change what he, Binstock and others are trying to do in Minnesota. They want to better manage water that leaves the soil to not only lower nitrate levels, but also increase yields. In the end, the goal is to clean up or at least shrink, the hypoxic zone in the Gulf of Mexico.

The hypoxic zone is formed when algae dies and deprives the water of oxygen. The size of the hypoxic zone in the Gulf of Mexico varies from year-to-year, Binstock said. Eighty percent of the land mass that the water in the Gulf comes from is under agricultural production, he said.

Binstock said that farmers need to think twice before they install new tile. It may be more important to pay a little extra upfront than to come in later and try to retrofit the system. Drainage water management won't fit everybody, he said, that's why researchers are evaluating bioreactors, saturated buffers and ponds, any way to treat or reserve water on the landscape for a time before releasing it.

Farmers in the Corn Belt are spoiled, Binstock said, and they don't realize how valuable water is. In other states, farmers pay for water.