

Saturated buffers a new tool to improve water quality

BY DIRCK STEIMEL

Nick Meier takes a proactive approach to protecting water quality and reducing soil loss on his farm near La Porte City in Black Hawk County. And like a growing number of Iowa farmers, he is exploring a range of new technologies to help him reach his environmental goals.

That's why Meier was eager to participate when researchers were on the lookout for a farm in the Miller Creek watershed to install a saturated buffer. It's a new type of conservation structure that has shown promise in removing nitrates and other nutrients from tile-drained water.

"I really wanted to learn more about this technology. I wanted to see how it will work on my farm," Meier, a Black Hawk County Farm Bureau member, said as he watched technicians install the saturated buffer on his farm earlier this spring. "It goes beyond the filter strips we put in about eight to 10 years ago, and I think it can really make a difference in improving water quality."

Research on saturated buffers bears that out, according to



Black Hawk County farmer, Nick Meier, right, watches as technicians install a saturated buffer on his farm near La Porte City. The saturated buffer is designed to remove nitrates and other nutrients from tile drainage water.

PHOTO/DIRCK STEIMEL

New website helps farmers back GMOs

The new American Farm Bureau site helps farmers get facts to support biotech.

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Cash rental rates slip lower in ISU survey

With crop prices lower and margins tighter, cash rental rates for Iowa farmland are under pressure.

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NE Iowa dairy farm welcomes visitors

The Suhr farm near Fredericksburg helps school kids get a first-hand look at agriculture.

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Crops or cattle? New tool aids that decision

A new land analyzer from Iowa State University Extension can help farmers determine the best use for their rolling ground.

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BUFFER

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Dan Jaynes, a soil scientist at the U.S. Department of Agriculture's (USDA) National Laboratory for Agriculture and the Environment, which is located on the Iowa State University (ISU) campus. He's helped to install several saturated buffer research projects around the Midwest, including a pioneering one installed in 2010 at Bear Creek in Story County. That project was funded by a grant from the Leopold Center at ISU.

A saturated buffer, Jaynes said, is designed to enhance the performance of a buffer strip by reworking it so it can intercept and treat tile drainage, as well as surface water. "We've found that they work very well. For the tile water that's flowing through the buffer, it's taking the nitrate level down to zero," Jaynes said.

He and other researchers believe that saturated buffers could be a valuable tool for farmers as they ramp up their efforts to reduce nutrient loss and continue



JAYNES

to improve Iowa's water quality.

No drainage restrictions

While it enhances the buffer strip by treating a portion of the tile water drainage, the saturated buffer doesn't restrict drainage or adversely affect field work by making fields too wet, Jaynes emphasized. "The idea with the saturated buffer is that you can put them in and forget them and they will keep doing their job by removing nitrates for years and years. There really are no moving parts."

Another advantage is that the system can be installed quickly and fairly inexpensively, Jaynes said. He estimated the installation of the saturated buffer, with equipment and tile work, will cost a farmer about \$2,000 and require only a few hours to install.

To install the saturated buffer on the Meier farm, tiling technicians first dug a hole in a well-established buffer strip and dropped in a drainage control box. The box, once buried, was connected to an existing tile line that moves water collected from the pattern tile of a nearby field.

The technicians then bury a perforated tile line laterally under the buffer strip for several hundred feet, parallel to the stream. One outlet on the control box is then



Farmer Nick Meier, left, and Gene Etringer feed a machine installing perforated tile along a buffer strip on Meier's Black Hawk County Farm. The perforated tile is part of a saturated buffer designed to reduce nitrates and other nutrients from tile drainage. PHOTO/DIRCK STEIMEL

connected to the line of perforated tile and the other is to the line that goes to the stream.

Diverting drainage

The control box will divert a portion of the tile drainage water through the perforated tile and into the soil beneath the buffer strip. The water will saturate the root zone of the buffer strip, where high-organic soils and deeply-rooted grasses will work to remove nitrates and other nutrients.

Jaynes, along with Tom Isenhardt, an associate professor in ISU's Natural Resource Ecology and Management program, are installing saturated buffers in targeted watersheds around the state as part of a project funded through the Iowa Nutrient Research Center. The center, part of the state's water quality initiative, is designed to promote research into new practices that show promise in reducing nutrient loss and improving water quality.

With each saturated buffer, the researchers are installing a series of monitoring wells so they can determine how well the structure is working at removing nitrates and other nutrients. They are also installing rain gauges and other monitoring systems to see how the saturated buffer performs in varying weather conditions.

In normal conditions, the saturated buffer is designed to intercept and divert 30 to 50 percent of the water coming from the tile line, Jayne said. "It's a pretty significant percentage and should definitely make a difference."

Many technologies

The saturated buffer is just one of the technologies that Meier is looking into on his farm. Working with Shane Wulf, coordinator of the Miller Creek Water Quality Improvement Project, he's planning to install a bioreactor on this farm after soybean planting is complete. Meier has also experimented with no-till and strip tillage on his farm.

"It's really important to try all of these different technologies that are available for conservation and water quality. That way, we can see which ones work the best for us," Meier said. "I don't want to lose any nutrients at all from my fields, if I can help it."

AVIAN FLU

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farmers who raise grain used in poultry feed," Watne said.

Sam Utech, a general manager of Centrum Valley, understands the pressure the threat of avian flu puts on its employees and families. He has several friends in the industry who have been affected. Each story, each confirmed case, makes it more real.

"It's become a lot more emotional. It's like we're living under this threat, this pressure. And every day you feel like ... I can do this ... one more day," he said in an exclusive interview with the Spokesman. "And you know that it could all change in a few hours."

The company is doing what it can to keep avian flu off its farms, Boomsma said. He had visited Washington, D.C., earlier in the week to discuss Centrum Valley Farm's biosecurity and management plans at the offices of Iowa Reps. Steve King and Dave Loebsack and Sens. Joni Ernst and Charles Grassley.

Visiting restrictions

The company has done away with visitors, and even managers are limited to visiting one site per day. The companies that service the vending machines aren't visiting these days.

Every employee is screened before going to work for the day. Their vehicle's tires are disinfected before entering the parking lot for the day. All employees are asked to stay on site during their dinner break for fear of tracking

the virus back onto the site when work resumes.

The county's emergency action plan helped by closing routes around the farms. Barricades and staffers keep visitors and passers-by away.

The company is taking steps to keep the virus away by disinfecting tires of the semis that come into the farm's feed mill. The company has 45 semi loads of feed that is routed to its farms on a daily basis.

"We're trying to isolate each site as its own entity," Boomsma said.

Feed trucks and employees are limited to one site per day, he said.

Neutralizing air

Gravel roads around sites are sprayed to keep dust to a minimum. Sites are "fogged" with a sanitizing spray to neutralize the air around the barns.

The virus has become more work for the company's human resources department, Boomsma said. The department has analyzed all of its 405 employees to determine how much of a risk they are in tracking the virus into their barns.

The department's staff has mapped out what each employee's personal and social life look like. They've rearranged work arrangements if one spouse works at a separate barn from the other. Now, they work together.

Though extended periods of warm weather are expected to keep the virus at bay, the virus is expected to reappear in the fall and next spring as birds begin their migration.

The new normal

Despite the expected slowdown in cases, Boomsma said the heightened biosecurity measures at the company's farms is the new way of doing business.

"We were told loud and clear in Washington, D.C., that life is changed for the egg industry as far as biosecurity. This will ramp up and then have to stay in place," he said.

Boomsma said he's confident in the efforts that have been made to keep the sites clean. There isn't



Wright County officials have closed roads, including this one near a Centrum Valley Farms egg laying barn. The county, the state's leader in egg production, has closed roads and taken other bio-security precautions to slow the spread of avian influenza. PHOTO/BETHANY BARATTA

much more that the county or the company can do, he said.

"To be honest with you, it's pretty much out of our control. We get up every morning trying to do the best job we can. And that's all we can do," Boomsma said.

Difficult to sleep

Utech said he's been having dreams — nightmares, really —

about what could happen. He hasn't had a good night's sleep in weeks.

"There's a whole aspect for all of us managers that if we ended up positive we failed the company, we failed the job. While we know intellectually that it's not our fault ..., that's the overall fear and sentiment that exists," he said. If Centrum Valley Farms was

hit with the virus, it would take two to three years before it could return to full capacity, Boomsma said.

"If this virus would get into ours and would have to depopulate, it would take us between two and three years to get back to normal. We can't grow that many birds at a time. It would be devastating. It would be almost like starting over," he said.

Budget bills progress in the Statehouse

Budget bills continue to move through the legislative process, with each chamber sending several appropriations bills to Conference Committee.

The House passed their version of Senate File 494, the Agriculture and Natural Resources budget. It includes a \$250,000 increase for the conservation cost-share program, bringing the total to \$7 million.

The bill maintains the status quo funding of \$4.4 million for the Water Quality Initiative, as well as \$1.23 million for a three-year pilot project to quantify conservation structures and crop production practices to determine the impact on water quality. Farm Bureau supports these increases,

as well as the proposed increases in the Rebuild Iowa Infrastructure Fund budget, House File 650. Each chamber has passed their version of Senate File 494, which is now in Conference Committee.

The Senate passed Senate File 505, the Health and Human Services appropriations bill, which includes a provision to extend the current property tax funding mechanism for one year. Farm Bureau supports this extension as a way to protect property taxpayers and will work to ensure these protections are extended into future years. The bill is currently under consideration in the House.

PPEL measure

The Senate passed House File



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646, which expands the current Physical Plant and Equipment Levy (PPEL).

The bill allows for certain transportation equipment repairs to be shifted to the PPEL levy. Farm Bureau believes these costs should be funded through the current school finance funding formula, as opposed to being funded solely by property taxes. House File 646 passed the Senate and now goes to the governor's office for consideration.

FUNDING

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flu—is a very high priority and receives necessary funding.

Grassley and others in the Iowa Congressional delegation also sent a letter to Vilsack urging him to provide any assistance possible under its statutory authority to help affected states combat the recent avian flu outbreak.