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Polk County has an aggressive plan to clean up its water. Could it work for the rest of Iowa?

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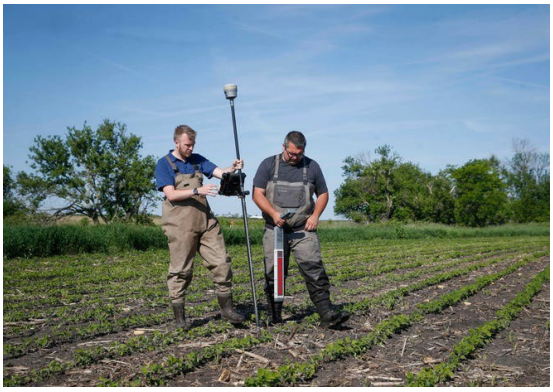

John Swanson, right, of the Polk County Public Works and Tanner Puls of the Polk Soil and Water Conservation District survey an underground tile outlet at a farm in rural Slater on Thursday, June 3, 2021. *Bryon Houlgrave/The Register*

Polk County could have a response to one of the biggest criticisms farmers face with Iowa's voluntary approach to improving water quality: that they're too slow to adopt conservation practices that can curb runoff into the state's rivers, streams and lakes.

The county is leading a local, state and federal partnership to rapidly build saturated buffers and bioreactors — 51 this year alone, and 150 the following year. The structures are one of the most effective ways that farmers can curb runoff of nitrogen, and to a lesser extent, phosphorus, into Iowa's waters.

The nutrients that feed crops wreak havoc with water quality: Phosphorus, combined with nitrogen, feeds harmful algae blooms that befoul Iowa's lakes and rivers for recreational users and degrade drinking water quality. And high nitrate levels require Des Moines Water Works and other utilities to spend millions of dollars on extra treatment to make water safe to drink.

Iowa has only about 130 saturated buffers and bioreactors statewide. So over two years, the projects built under the Polk County program would more than double that number.

"We need to be building 100 at a time, not one or two," said John Norwood, a Polk Soil and Water Conservation District commissioner and a program architect.

Iowa Agriculture Secretary Mike Naig agrees the state "absolutely must accelerate" conservation work to improve water quality. He sees the program as a potential model for the state.

"There's no doubt that we need to increase the ability to get more work done," Naig said.

But Alicia Vasto, associate director of the Iowa Environmental Council's water program, questions whether rural counties will have the financial capability to re-create the Polk program, which targets the Raccoon and Des Moines river watersheds.

One estimate: 120,000 buffers, bioreactors needed to improve water

A saturated buffer not only cleans surface water, as a typical grass buffer would, but filters runoff that flows underground.

To create buffers, a builder installs perforated underground pipes that intercept the drainage tile at the top of the buffer, redirecting the runoff laterally, parallel with the stream. That lets the water run through the roots of trees, grasses and shrubs to filter out pollutants before it reaches the waterway.

Saturated buffers can reduce average nitrate levels by at least 40% and phosphorus levels by 20%.

With a bioreactor, runoff in a drainage tile is diverted through a wood chip-filled trench where microorganisms feast on nitrates, lowering their level by 43% on average. They're suitable for farms where the tiles don't drain directly into waterways.

The county and state agriculture department are sharing the bulk of the program's first-year, $400,000 cost for work in Polk and Dallas counties. All the farmers' expenses are covered under the initiative.

"Across the state, we would need to build 1,200 bioreactors and saturated buffers every single year ... over 100 years" to meet the state's nutrient reduction goals, said Vasto, whose group supports mandating that Iowa farmers adopt conservation practices to reduce nutrient losses.

Minnesota, for example, requires farmers to maintain buffers along waterways up to 50 feet wide to help filter surface runoff before it reaches rivers, lakes and streams. In Iowa, by contrast, farmers can plant crops right up to streambanks.

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"I don't think you can get there with a voluntary strategy," said Vasto, whose group released a report in 2019 showing it will take the state hundreds of years to reach some of its water quality goals at its current pace.

One scenario outlined in the state's nutrient reduction strategy, designed to reduce nitrogen and phosphorus losses, says Iowa would need not only 120,000 saturated buffers and bioreactors, but 12.6 million acres of cover crops, and wetlands treating 7.7 million acres.

The state seeks to cut by 45% the nitrogen and phosphorus that flow out of Iowa and down the Mississippi and Missouri Rivers, contributing to a dead zone emanating from the mouth of the Mississippi in the Gulf of Mexico that's unable to support aquatic life during summers. The state has set no deadline to reach the goal.

Norwood believes the blitz program, which streamlines siting, designing, funding and building the so-called "edge-of-field" measures, also could be used to accelerate other conservation practices — from building hundreds of wetlands to planting millions of acres with cover crops to hold soil in place between growing seasons.

That's especially important as Des Moines and Cedar Rapids, Iowa's largest cities, look to invest hundreds of millions of dollars to develop whitewater rafting, kayaking and other recreational activities along the Des Moines and Raccoon rivers in central Iowa and the Cedar River in eastern Iowa.

"We're not going to solve our water quality issues with just saturated buffers and bioreactors," Norwood said.

Polk County taking initiative on water structures could help farm adoption

Saturated buffers and bioreactors are usually the last conservation option that farmers consider, said John Swanson, a Polk County watershed management authority coordinator who is helping lead the project.

They cause an expense that adds little to a farming operation's bottom line, require jumping through bureaucratic hurdles, and are difficult to find a contractor to build, he said.

"Almost always, these practices fall to the bottom of the barrel," he said.

The structures can reduce nitrate levels by at least 40% — and as much as 90%. But over the past five years, Polk County farmers and landowners have built just six bioreactors and saturated buffers.

Climate warriors: Iowa farmers are joining new initiatives that pay them to battle climate change

Polk County's goal in Fourmile Creek, one of three watersheds targeted this year in the program blitz, is to build 100 saturated buffers and bioreactors. "We thought we'd never get there," Swanson said. "So we sat down and asked how we could systematically get more structures on the ground."

Officials decided they needed to streamline the process to get farmers and landowners to participate — assessing locations for the nitrate removal structures, engineering the structures and getting federal approval to build them, Swanson said.

Local, state and federal conservation experts do the field work. They use mapping technology to find the outlets of underground field drainage tiles that could be possible candidates for the nitrate-reduction structures, then contact the landowners.

Polk County does the administrative work, acting as the project manager and providing the primary financing along with the Iowa Department of Agriculture. The initiative gets some additional funding from the Natural Resources Conservation Service, city of Des Moines and Polk Soil and Water Conservation District.

The county also has bundled the projects together, hiringone company to build all the structures, which lowers costs, Swanson said.

That was important, Norwood said, because contractors, whose main income comes from installing underground drainage, often are hesitant to build the buffers and bioreactors. "It was a side job for a lot of contractors," he said.

As June began, Swanson's crew was mucking through fields and streams north of Alleman, assessing and ranking locations for what will be among the 150 saturated buffers and bioreactors that are built next year.

Swanson estimates that costs for the second year will reach $800,000, with NCRS potentially picking up a larger share of the expense.

The team is working with Story County to add saturated buffers and bioreactors in 2022 and will target the Beaver Creek watershed in Dallas, Boone and Greene counties in 2023.

Even though Polk County is exponentially adding to Iowa's saturated buffers and bioreactors, "it's still a drop in the bucket," based on the state's needs, Swanson said. "We want to figure out how to get hundreds in every county."

Model farm shows what's possible in water conservation

Lee Tesdell's farm north of Ankeny is a conservationist's dream. His roughly 80 acres already have terraces and a grassy waterway to prevent rain from washing down his fields, picking up soil — and phosphorus — with it.

He's also built 50-foot buffer strips along both sides of Alleman Creek, which eventually drains into the Des Moines River. The Des Moines, along with the Raccoon River, is a source of drinking water for 500,000 central Iowa residents.

He's added a prairie strip, filled with native grasses and flowers, that ties into his terraces. The buffer and prairie strip help slow heavy rains. The plants filter nitrogen and phosphorus from the surface runoff and catch sediment, pesticides and herbicides.

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Tesdell also has a saturated buffer and bioreactor on his farm that scientists test to assess their effectiveness at reducing nitrogen and phosphorus losses. Five new saturated buffers will be built on his land this year, capturing nutrients lost from his farm and his neighbor's.

Mike Baltes, who manages a 450-acre farm in Dallas County, said enrolling in the program was "a no-brainer." The farm already had a buffer strip that could be converted into a saturated buffer, both reducing runoff and slowing water flows during heavy rainstorms.

The farm is in the Fourmile Creek watershed, which experienced record flooding in 2018, inundating parts of Des Moines and destroying dozens of homes and businesses. The blitz also is targeting the Walnut, Mud, Spring and Camp creek watersheds this year.

"It's doing a great thing for the environment," said Baltes, who works for Hertz Farm Management in the Story County city of Nevada. He said clients "want to be good stewards of the land and also do their part for cleaner water in Iowa."

Agriculture plumbing is infrastructure — and 'it's leaking'

Iowa's water quality issues garnered national attention in 2015, when Des Moines Water Works sued drainage districts in three northwest Iowa counties, saying the underground tiles act as conduits, funneling nitrogen and phosphorus into the Raccoon River.

The utility said it must pay thousands of dollars, sometimes millions, each year to remove nitrates from the water so it's safe to drink.

The lawsuit was dismissed two years later, but Des Moines Water Works still struggles with high nitrate levels and toxic blue-green algae blooms, which generate harmful microcystins that are difficult to treat and remove from drinking water.

To really make headway on Iowa's water quality problems, Norwood said the state needs to ramp up building wetlands, which can remove nitrates from 1,000 acres or more, compared to a saturated buffer's roughly 40 acres.

The state has identified 1,600 possible wetland locations, and Polk County's model could help build them, he said. While the nutrient reduction strategy estimates Iowa will need about 7,000 wetlands, it so far has only about 100 wetlands that treat 107,000 acres.

"Instead of going farm by farm, practice by practice, the value can be magnified 10 to 100 times if we can figure out how to deliver this stuff in a way that creates scale," Norwood said.

Naig said the state is accelerating wetland construction, helped by the Legislature's efforts to boost spending on water quality initiatives. "It's taken us 15, 20 years to build 100 nitrate-reduction wetlands, but we have 30 under development that will be built in the next two to three years," he said.

A bill signed into law three years ago provides $282 million over 12 years for water quality initiatives. It was extended this year, generating a total of $320 million through 2039. Altogether, $331 million will go to conservation practices over two decades.

Vasto said the state could dramatically increase its conservation investment if lawmakers raised the sales tax three-eighths of a cent to fund the Natural Resources and Outdoor Recreation Trust Fund, which would generate nearly $180 million annually to support recreational and water quality initiatives.

State lawmakers have never funded the trust fund, which Iowans overwhelmingly voted for in 2010.

The Polk County approach also could help position the state to tap into President Joe Biden's proposal to invest $2 trillion over a decade to strengthen the nation's roads, bridges and other infrastructure, Norwood said.

Experts estimate that 14 million of Iowa's 24 million acres of corn and soybeans have tiles underground to drain excess water.

"This ag plumbing is infrastructure as much as anything else being considered," Norwood said, and "it's leaking."

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