BUSINESS

Farmers make progress in keeping fertilizers out of Ohio waterways, but much work remains

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View Comments

Nate Douridas, farm manager, harvests a few ears of sweet corn at the Molly Caren Agricultural Center in London. Douridas studies practices that farmers are adopting to reduce soil run off. *Barbara J. Perenic/The Columbus Dispatch*

Fred Yoder found that applying nitrogen-infused fertilizer to his fields three times in a growing season instead of all at once helped his crops use the nutrient more efficiently, and less nitrogen ended up in rivers and streams.

The move also saves the Plain City farmer money. If fertilizer stays in the soil, he doesn't have to buy as much of it.

Research backs Yoder’s strategic application of nitrogen.

“Timing is one of our best assets in managing nitrogen and keeping it out of the watershed,” said Nate Douridas, farm manager for the Molly Caren Agricultural Center in London.

Yoder just wishes he could convince every farmer in Ohio manage soil in a similar way.

"I'm the cheerleader trying to get farmers to do more than they're doing," he said.

Rescuing Lake Erie from toxic algae

For years, farmers like Yoder adopted growing methods to keep nitrogen and phosphorus from seeping into the waterways that feed into Lake Erie and cause the dangerous algae blooms. The impact of these sustainable farming techniques, however, remains a matter of debate, and nearly everyone agrees more must be done.

The governors of Michigan and Ohio and the premier of Ontario banded together in 2015 to form the Western Lake Erie Collaborative Agreement with the goal of reducing phosphorus run-off by 40% in 10 years. Ohio's government funded conservation practices through the H2Ohio program, which involves some 1,800 farmers. Six years later, the collaborative points to measurable progress. However, some researchers question the forces underlying that progress and want to encourage more farmers to embrace sustainable farming.

The stakes are high for anyone who depends on Lake Erie for livelihood or drinking water. In the summer of 2014, more than half a million people living in and around Toledo were ordered not to drink tap water for three days. The algae blooms in Lake Erie, which abuts Toledo to the north, grew to ominous size and news outlets ran photos of a lake tinted green by algae growth.

Roughly 85% of the runoff responsible for algae blooms comes from so-called non-point sources, which means crop fields in most instances, according to a nutrient mass balance study from the Ohio Environmental Protection Agency.

Fertilizers contain nitrogen and phosphorus, and when strong rains saturate the soil, excess water runs off into rivers, bringing harmful nutrients with it, said Dr. Judy Zhang, a professor of environmental engineering at Case Western Reserve University who studies emerging contaminants.

Because the algae grows, it needs a lot of oxygen, then that in turn is going to affect aquatic life," Zhang said. "Everything growing in the lake needs a lot of dissolved oxygen. (If they don't get it) fish will die and water will not be in a healthy condition. And when algae die, they become carbon sources, and that fuels the growth of microorganisms."

How farmers can reduce fertilizer runoff

The farming community points to a recent dip in phosphorus in the Lake Erie watershed as proof its farming techniques make a difference.

"Of the main nutrients that go into algal blooms (phosphorus), we're seeing slight decreases of that coming into the lake, and I think that progress is going to continue," said Jordan Hoewischer, director of water quality research at the Ohio Farm Bureau Federation.

A variety of practices are responsible, he said. Farmers have put buffers between waterways and their fields, stopped tilling soil, and tested fields to keep excess nutrients to a minimum. The techniques work in tandem, Hoewischer said.

"There isn't one thing that each farmer can do that's going to improve everything dramatically," he said. "It's really about taking an a la carte approach."

A working farm at the Molly Caren Agricultural Center, which is part of the Ohio State's college of food, agricultural and environmental sciences, provides a testing ground.

"We have found that phosphorus and nitrogen both need a different level of management to keep them out of the watershed," Douridas said.

Farmers throughout Ohio use those practices.

Ben Bowsher planted grass and dug ditches around the fields of his 1,600-acre Allen County farm where he and his wife Stephanie grow corn, soybeans and wheat. The trenches and grass pastures form a buffer blocking erosion and runoff.

We have ground that drains in the Auglaize River, which ends up in Lake Erie," he said.

Planting crops without disturbing the soil - thereby keeping nutrients in place - is also common in Ohio. Kenton farmer Paul Ralston said his family adopted the practice in the 1990s.

"We're not strictly no-till," he said, "but we don't do full tillage ever."

Money is a barrier. Grants can offset the cost of conservation practices, but are unlikely to cover all the money growers need to spend, Bowsher said.

"As far as benefits, you can't necessarily put a dollar amount on," he said. "The biggest thing is the conservation aspect."

The number of farmers who use such practices is not entirely clear. Farmers involved in the H2Ohio program have fields that account for around 1 million of Ohio's 4 million acres of farmland. But those figures don't include farmers pursuing conservation on their own.

Starting to show success in Lake Erie

Nutrient levels in the Lake Erie watershed fell in the past two years. Total particulate phosphorus in the Maumee River, for example, dropped from more than 1,600 metric tons in 2019 to less than 1,400 in 2020. And phosphorus levels are projected to drop by half in 2021, according to a recent report from Heidelberg University in Tiffin. Although that figure is still above the university's target of 674 metric tons.

"I would say that, while I think there are a lot of good efforts moving in the right direction, we haven't quite seen the needle moving yet," cautioned Dr. Laura Johnson, director of the National Center for Water Quality Research at Heidelberg.

Weather can impact nitrogen and phosphorus levels, she stressed. Low phosphorus levels in the Lake Erie watershed are partially attributable to low rainfall in recent years, according to Heidelberg.

"When we were developing the targets for Lake Erie, the concern was we didn't want the extremes to have big influence over interpretations of data," Johnson said.

Phosphorus lingers in soil for years, said Dr. John Senko, a professor of geosciences and biology at the University of Akron

"Even if you cut it off all at once, the mass of phosphate remains a threat," he said.

If the presence of algae blooms is the yardstick with which to measure progress, the situation remains dire, said Dr. Thomas Bridgeman, director of the Lake Erie Center at the University of Toledo.

"There is no sign that the blooms have been decreasing in any systematic manner," he said.

Although the fact that those blooms aren't getting worse might be itself a measure of progress.

"The problem was getting worse and worse and worse throughout the 2000s, and it looks like it may have leveled out," Bridgeman said. But he added, "The concentrations of phosphorus are still far too high."

And individual farms don't need to lose much phosphorus to contribute to the problem, said Sandra Kosek-Sills, an environmental specialist for the Lake Erie Commission.

“Each farmer from each field may only be losing a jar full of phosphorus,” she said. “That’s negligible from a farmer's point of view. They're not losing anything. But that teeny tiny amount can make a big difference when concentrated in the lake.”

Although some researchers are heartened by the apparent dip in phosphorus levels even as they encourage farmers to do more.

“We do think we are headed in the right direction,” Lake Erie Commission Director Joy Mulinex said.

Meanwhile, farmers continue to experiment with sustainable farming. The trick is figuring out which tactics work.

Kenton farmer Paul Ralston uses cover crops, which help fields retain nutrients by holding the soil in place. The grower alternates between corn and soybeans, and wants to know which cover crops are most adept at retaining nutrients between growing seasons.

“I haven't found the perfect combination there yet,” he said.

Millennial farmers love using technology and are open to new farming techniques, but many older growers are set in their ways and need a bit more coaxing, Yoder said.

The Plain City farmer finds making a financial case is the best way to bring reluctant farmers off the fence.

“One of the first things farmers think of is how much is this going to cost to change my ways,” he said. “People just assume if you change, you have to invest in new equipment, and there’s going to be an indebted cost, but that’s not necessarily true.”

Ralston embodies many of the attitudes Yoder wants to instill in Ohio’s farming community. Any fertilizer that leaves his field is wasted money in his eyes.

“I invested a lot to just let it float down the river,” he said. “Anything we can do to save it, that's what we're doing.”