

# Understanding farmers' perspectives on conservation practices, water pollution

December 9 2022, by Addison Dehaven

---



Lake Mitchell, located in southeastern South Dakota, has a long history of algal blooms. Credit: Kyle Croce

Nonpoint source pollution is the primary cause of the algae overgrowth that infiltrates eastern South Dakota lakes, rivers and ponds toward the end of every summer. The water's pollution can be traced back to the runoff from agricultural land, which is filled with excessive nutrients from the fertilizer used to ensure a strong crop yield.

The resulting algae, often known as an "algae bloom," can sometimes be harmful and have negative impacts on humans, wildlife, pets and livestock.

Tong Wang, an associate professor in the Ness School of Management and Economics at South Dakota State University and an SDSU Extension advanced production specialist, has spent the past few years gaining a better understanding of nonpoint source pollution, farmers' perspectives on water pollution and solutions to the problem.

Her research paper, titled "Adopting cover crops and [buffer strips](#) to reduce nonpoint source pollution: Understanding farmers' perspectives in the U.S. Northern Great Plains," was published in the *Journal of Soil and Water Conservation*.

Wang's research looked to gain a greater understanding of South Dakota, Nebraska and North Dakota producers' perspectives on water pollution and some associated conservation practices. To do this, Wang and a former colleague sent out a survey to farmers in those three states, garnering 574 effective responses. The survey listed 12 issues related to water pollution and asked farmers to identify what they believed to be an issue.

In South Dakota, the survey results showed that farmers see excessive algal bloom, excessive aquatic plants and polluted swimming areas as the three biggest water quality issues. They viewed seven of the aforementioned issues as "a slight problem."

According to the South Dakota Department of Agriculture and Natural Resources, the major water quality problems in South Dakota continue to be excessive nutrients and algae, due to nonpoint source pollution, primarily from agriculture. Nitrogen used to be regarded as one of the best inputs in terms of cost-effectiveness for farmers, which is why the

over-application—and subsequent deposit into bodies of water—was common.

Per peer-reviewed research, a "high nitrate level in water causes various aesthetic, health and [economic issues](#), including rapid growth of aquatic plants and algal bloom, decreased fish population, polluted swimming and boating areas, potential health risks and eroded tourism revenues."

While nitrogen can have a negative effect on the surrounding environment, farmers are looking to make decisions that allows them to remain financially stable, Wang notes.

"Companies need to make optimal decisions to increase their profit," Wang said. "Farms are similar to a company. Farmers are trying to make an optimal choice for themselves."

Interestingly, Wang's research found that some farmers didn't realize where nonpoint source pollution was emanating from and if water pollution was even a problem.

Helping farmers understand what the issues at play are is a priority for coming up with real, tangible solutions, which is why Wang theorized that outreach efforts to help educate farmers may be an important step in reducing water pollution.

"People are more likely to change their behavior with more information from their trustworthy information sources," Wang said.

Farmers can play a critical role in reducing nonpoint source pollution by incorporating conservation practices. In Wang's research, she identified both cover crops and buffer strips as effective practices that can improve water quality near agricultural lands.

Cover crops, the inverse of cash crops, are plants that are used for the sole purpose of covering the soil. After the main crop is harvested, a cover crop—a wide variety of plants are available—is planted with the purpose of enriching the soil, improving soil infiltration and water storage capacity, and helping to reduce runoff.

Cover crops can also absorb excessive nitrogen and can even improve cash crop yield through improved soil health. The challenges that come with cover crops include up-front economic costs, unpredictable yield benefits and, for the Great Plains, a short window of time to plant cover crops.

Buffer strips are a well-established conservation practice that effectively traps sediment in the field and reduces nonpoint source pollutants from agricultural production through the planting of perennial grasses or trees between crop fields and bodies of water. While buffer strips, which are also known as riparian buffers, have proven off-site benefits, the challenges include additional costs to the farmers, increased labor and lost production areas.

"Both cover crops and buffer strips are highly recommended conservation practices to reduce soil erosion and nutrient leaching, and thereby reducing the pollution of groundwater and surface water," Wang noted. "Yet the adoption rates of these practices are still low."

Wang's research explored why adoption practices remain low.

Her main takeaway was the cost. A majority of farmers were unwilling to pay taxes in order to improve water quality, but they would incorporate conservation practices into their farm if it came at no direct cost to them.

"If farmers can see that by making this decision, it not only benefits the

river but also benefits my farm or me, then they are more likely to incorporate it," Wang said. "We found that if people realize that [water pollution](#) causes health or economic issues, then they are more likely to use [cover crops](#) (for example)."

In South Dakota, the Department of Agriculture and Natural Resources has made reducing nonpoint source [pollution](#) a priority. The department recently started the Riparian Buffer Initiative "to establish over 3,000 acres of new riparian buffers to make water quality improvements in South Dakota's watersheds."

Eligible producers and landowners can receive incentive payments and tax breaks if they chose to participate in the program. As the department points out, riparian buffers are an "excellent conservation practice but are not used enough to provide significant water quality improvements in South Dakota's impaired watersheds."

Wang's study provided an enhanced understanding of why farmers did or did not incorporate conservation practices on their farm. To reduce the water quality issues in South Dakota, conservation practices must be adopted, she said. However, it is clear that farmers want—and need—support in adopting those practices.

"More research could be conducted to better understand conservation practice adoption processes and identify key steps and information sources that could help farmers make accelerated and better-informed decisions to curtail water quality problems," Wang concluded.

**More information:** T. Wang et al, Adopting cover crops and buffer strips to reduce nonpoint source pollution: Understanding farmers' perspectives in the US Northern Great Plains, *Journal of Soil and Water Conservation* (2021). [DOI: 10.2489/jswc.2021.00185](https://doi.org/10.2489/jswc.2021.00185)

Provided by South Dakota State University

Citation: Understanding farmers' perspectives on conservation practices, water pollution (2022, December 9) retrieved 21 June 2024 from <https://phys.org/news/2022-12-farmers-perspectives-pollution.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.