

This is Wisconsin Water News, a production of the University of Wisconsin Sea Grant Program. I'm your host, Marie Zhuikov. Today's episode is:

Herbicide Study Finds Good News, Bad News for Use of Fluridone in Lakes

In a study recently published in the journal, "[Aquatic Toxicology](#)," researchers found that while concentrations of the herbicide fluridone similar to those used when it's applied to lakes to control Eurasian watermilfoil and hydrilla did not kill fathead minnows, it can impact fish health in more subtle ways.

"The good news for fluridone is that it didn't really have any impacts on survivorship or even on fish growth, which was to be expected. But when we looked at some of the more sensitive endpoints, particularly prey capture and endocrine disruption, we see that at certain concentrations there seems to be an impact on those endpoints,"

That's Gavin Dehnert, a member of the research team and Wisconsin Sea Grant's emerging contaminants scientist.

Fluridone is one of the major active ingredients in commercial aquatic herbicides. It affects the entire plant by inhibiting its ability to photosynthesize, which eventually leads to death. The Wisconsin Department of Natural Resources is interested in using herbicides containing fluridone as an alternative to those containing 2,4-D, which [preliminary research has found can be toxic to fish](#).

Dehnert said that before commercial use, the Environmental Protection Agency mandates testing of fluridone to ensure it does not impact fish survival and growth parameters such as length and weight. This testing is done with very high concentrations and recommendations are derived. Dehnert explained that there's an issue with this method.

"The problem is, they (the EPA) rarely test the actual lower concentrations that they say are safe for the lake. That's usually a big question mark. It's like, well, they just said it was safe, but is it actually?"

The research team, led by William Karasov with the Department of Forest and Wildlife Ecology at the University of Wisconsin-Madison, exposed fathead minnows to concentrations of fluridone that would be found in a lake during treatment.

Unlike 2,4-D, which only needs to be applied once, fluridone herbicides could require several applications to a lake to be effective over a minimum of 45 days but usually closer to 90 days. The minnows were exposed to the chemical in the lab for 35 days and then a subsequent generation of larval minnows from the original test group was exposed for 65 days.

After 30 days of fluridone exposure, the adult male fish showed an increased number of nuptial tubercles. These are little bumps found near the minnow's noses and they can indicate endocrine disruption. Dehnert explained that some herbicides, especially when they are used at low concentrations, can mimic fish hormones. He said the number of tubercles increases or decreases depending on how much androgen and estrogen a fish produces.

"That's really important to understand because it could have major impacts on reproduction."

The researchers also found that the fishes' livers were enlarged and that their ability to catch prey decreased significantly when exposed to fluridone, which could be because it impairs their ability to move. Previous studies suggest fluridone can act as a neurotoxin.

The DNR funded the study because, as Dehnert said,

"In the state of Wisconsin, everybody likes to fish and keep the fish. So, we're trying to make sure we protect them as much as possible."

Other members of the team included Angelo Cozzola and Amber White, all with UW-Madison.

That's it for this episode of Wisconsin Water News, just one of the ways that Wisconsin Sea Grant, which is 50 years old this year, promotes the sustainable use of Great Lakes resources through research, education and outreach. Listen and subscribe to us through I-Tunes and Google Play or at seagrant.wisc.edu. Thank you to Gavin Dehnert and thank you for listening.