



## RESEARCH PROVIDES TOOLS FOR FISH PRODUCTION



“These two treatments are preventative. You’ve got to plan ahead to manage the problem.”

CRAIG TUCKER

*Photos by Marco Nicovich*

## By Bonnie Coblentz

The right tools give catfish producers an edge in the battle against production problems, and research is providing those tools.

Ongoing research at Mississippi State University's Thad Cochran National Warmwater Aquaculture Center focuses on several aspects of catfish production. Two major problems facing producers are trematode infestation and off-flavor. Researchers have found that one chemical applied in the correct dosage can help producers win battle against both problems.

David Wise, Mississippi Agricultural and Forestry Experiment Station research professor, works with fish health. He said trematode infection is a significant problem among many catfish ponds in the state.

"It's kind of a sleeper problem in a lot of ponds, and it can creep up on you," Wise said. "Severe infections cause high mortality rates and are easy to recognize, but mild infections can be easily overlooked. Even though mild infections don't directly result in deaths, they dramatically increase the incidence of other infectious diseases and can reduce feeding rates by as much as 40 percent."

Channel catfish used in commercial production are one step in the complex life cycle of the trematode. Catfish are infested at the free-swimming cercariae stage when these organisms penetrate the skin and form a cyst.

The life cycle of this parasite starts when the adult trematode, located on the intestinal wall of the American white pelican, releases eggs into ponds. The eggs hatch and produce miracidia, which infect the first intermediate host, the ram's horn snail.

Cercariae released from infected snails infect catfish and can be observed as small raised bumps under the skin of the fish. In ideal water temperatures, infected snails can release thousands of cercariae per day and will continue to shed these until the snails die.

Trematode control focuses on ridding a pond of these disease-carrying snails. Hydrated lime and copper sulfate are both safe for catfish and effective at killing snails.



Research associate Todd Byars inspects ram's horn snails, a host for trematodes, which can cause health problems in catfish.

"Originally we looked at pond margin treatments using hydrated lime to kill the snails around the edges of the pond," Wise said. "We applied hydrated lime at the rate of 1 pound per linear foot of pond. It's messy, but it can be used during the summer and won't kill the desirable algae blooms."

Further research showed that copper sulfate is cheaper and safer to use, but it does kill desirable summer algae blooms. However, it can be used later in the year to treat the whole pond and can very effectively rid a pond of snails.

"Repeated toxicity trials found that we could kill close to 100 percent of the snails in a pond using copper sulfate applied with a chemical boat while not losing any fish and having no effect on dissolved oxygen or bloom," Wise said. "You have to apply it when the water temperatures are still warm, but after the summer algal blooms are gone."

Wise said any total pond treatment is a risky process, but this is a well-researched, targeted approach to treating an infected pond if margin treatments during the summer did not eliminate the problem.

Research also has shown that copper sulfate is a useful chemical in the battle against another significant problem in catfish production: off-flavor. Trained taste panels describe the flavor of catfish in terms of boiled chicken breast, sweet corn or pecan. Off-flavor is defined as any other flavor that is undesirable. The most common off-flavors are described as musty, or earthy.

Craig Tucker, MAFES researcher, said blue-green algae are the primary culprits for off-flavor. Research has shown that both copper sulfate and diuron are effective at eliminating these algae from treated ponds while leaving the fish safe for human consumption.

"Both chemicals are EPA approved, and when used correctly, are quite safe," Tucker said. "These two treatments are preventative. You've got to plan ahead to manage the problem."

Tucker said correcting an off-flavor problem that is detected when the fish are ready to harvest can take from a few weeks to more than a year. The best method is to control the blue-green algae in the period before harvest by selectively killing the undesirable algae while encouraging the growth of the desirable algae and phytoplankton.

"We finished a three-year study of copper sulfate in collaboration with the U.S. Department of Agriculture," Tucker said. "We found you can be pretty successful in managing off-flavor if the producer thinks ahead about his production and harvesting schedule, and uses the chemicals in the way we recommend."

MAFES and USDA researchers have evaluated hundreds of chemicals in the laboratory and dozens in pond tests to determine their effectiveness at preventing off-flavor. Further research could give producers more tools to fight this significant problem.

To learn more about ongoing MSU research on catfish production issues, visit the Thad Cochran National Warmwater Aquaculture Center online at [www.msstate.edu/dept/tcnwac/](http://www.msstate.edu/dept/tcnwac/).