

Research shows promise of deeper catfish ponds



Jim Steeby

Jim Steeby, left, and Craig Tucker monitor the accumulation of mud on pond bottoms.

Jim Lytle

By Bonnie Coblenz

One of the costs of operating a catfish farm is rebuilding ponds once a decade, but research is showing that if they are built deeper, they will last longer.

Jim Steeby, Extension aquaculture specialist with the Southern Regional Aquaculture Center in Stoneville, spent much of the summers of 1999 and 2000 documenting pond ages and the depth of sediment accumulated on pond bottoms. Catfish ponds have historically been built about 4 feet deep and must be rebuilt every eight to 10 years.

The pond-depth research is being conducted under the direction of MAFES aquaculture scientist and SRAC Director Craig Tucker as part of Steeby's doctoral program.

"Two things happen to ponds as they age," Steeby said. "Erosion on the sides of the ponds tends to make them fall together, and soft mud accumulates on the bottom, which makes harvest and pond manipulation difficult."

This sediment has a pudding-like consistency and doesn't compact well. It uses up a lot of oxygen intended for the

fish, and eventually takes up most of the space in the pond. In old ponds, this muck can be as much as 3 feet deep, leaving only about 1 foot of operational space for growing catfish

Steeby said shallow ponds have to be aerated two to three times more often than do ponds of a desirable depth. In order to aerate each time, the equipment has to function correctly, the electricity has to be on and a crew must be on hand to monitor the situation.

"Risk factors start multiplying when the water column is made shallow by the pond filling up with sediment," Steeby said. "There's no capture space for oxygen and no space for the plankton to work for you. The more dependent you are on aeration, the higher your risk is."

Based on this research, producers should budget \$80 to \$100 per year per acre of pond to rebuild. At the end of the pond's life, it costs \$800 to \$1,000 an acre to rebuild the pond, or about 70 percent of the cost of the original construction.

MAFES researchers propose building catfish ponds up to 3 feet deeper, for an average depth of 6 to 7 feet.

“There is an initial higher cost to building deeper ponds,” Steeby said. “Your electrical savings over the pond’s lifetime, however, will probably offset a good part of the expense, plus your overall risk is lowered.”

“If we build the ponds a little bit deeper to start with, we can have a good operational depth and use it out to 15 years,” Steeby said. “Ponds built 3 to 5 feet deep must be rebuilt every 10 years, or you can build them deeper and go 15 years without reconstruction.”

At \$1,100 to \$1,200 per acre, the deeper ponds cost more to build than traditional ponds, but there are savings over the long run.

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Another cost of rebuilding ponds is the time the pond is out of production. When using a bulldozer to rebuild, the pond loses one production cycle. However, if using a dirt pan, the pond must be given time to dry to 10 to 20 percent moisture, a process that can take two years.

“I haven’t met any farmer who didn’t think that it was money well spent building a deeper pond,” Steeby said.

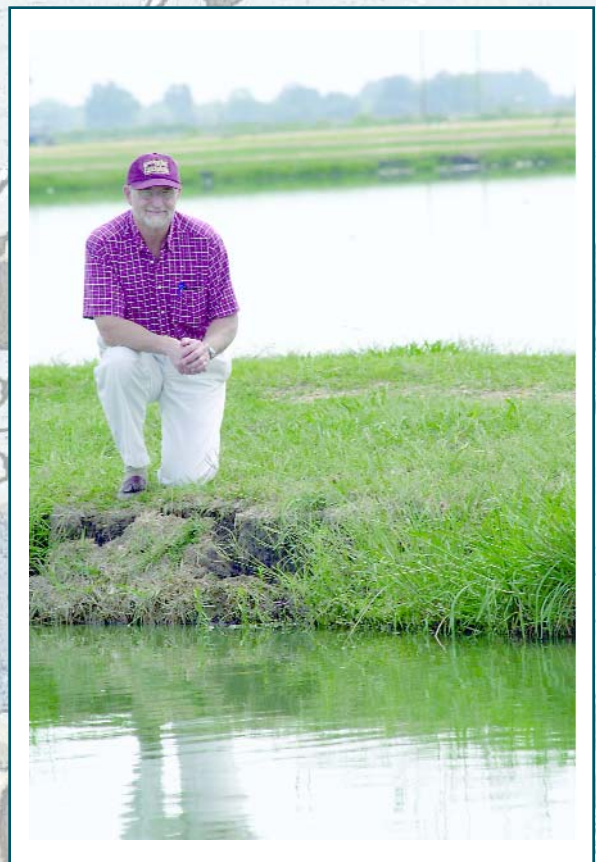
Tucker called building deeper ponds a fairly simple technique that is the only economically feasible solution.

“Catfish farming produces a fairly low-cost product by working with a fairly crude production system, an earthen pond. You could line the pond with plastic, but it would be too expensive, so you’re stuck with a fairly crude system,” Tucker said. “You have to work with the pond and understand it and try to manage it most efficiently.”

He added that levees between ponds must be wide enough to allow equipment to drive over and should be designed with the correct steepness to limit erosion. A cover crop further limits erosion, slowing the accumulation of sediment on the bottom of the pond. The next improvement that can be made is to dig the pond deeper, but not too deep.

Tucker described the three-way balance needed to maintain quality catfish ponds.

“The shallower the pond, the cheaper it is to build,” he said. “But if it’s too shallow, it’s very difficult to seine. Ponds that are too deep have water quality problems, as water stagnates on the bottom, but deep ones allow sediment to accumulate longer before filling up the pond.”



Jim Lytle

The sides of ponds deteriorate as they age.