



Small Farm Field Day

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AQUACULTURE IN RE-CIRCULATING SYSTEM

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OBJECTIVE — The focus of this demonstration/research is to provide small-scale producers with knowledge and information regarding fish production in a re-circulating, indoor tank system (tilapia).

OPPORTUNITY — Aquaculture is the fastest growing segment of U.S. agriculture. Tilapia production accounts for approximately 4% of the \$1 billion U.S. aquaculture industry, and that portion is increasing as consumer demand increases. Tilapia, a freshwater, plant-eating fish native to Africa, is considered an ideal fish for aquaculture. Tilapia grow in a variety of environmental conditions, breed easily in captivity, are efficient converters of feed, and appeal to consumers. North Carolina's prominence as a source of tilapia has grown rapidly in the past few years.

To make tilapia production economically feasible, producers use enclosed (indoor tank) systems, which allow production at greater populations than they would be able to achieve in a natural setting. These systems require use specialized equipment, which filters waste from the water and adds oxygen as needed. This allows nearly all of the water to be reused rather than discarded. Ninety percent of U.S. grown tilapia are raised in this type of setting. Most of the US producers grow the fast-growing species *Oreochromis niloticus*.

METHOD — A&T's aquaculture facility is located in 30' x 40' insulated building with four rubber tanks of 950 gallons each, plus associated monitoring and water treatment equipment. Fingerlings are stocked and monitored for growth. Oxygen is supplied to the tanks with a blower pump. Automatic feeders distribute feed every 30 minutes for fish weighing less than one pound, and each hour for fish weighing more than one pound. The uniform timed application of feed throughout the day results in a more stable daily water quality pattern, requiring little or no direct control of the oxygen supply. The operator monitors the sludge collector for excess feed content and adjusts the feeding rate and amount in the automatic feeder. Floating feed is preferred as it allows the fish time to eat, before sinking to the bottom where it can be vacuumed automatically from the system.

DISCUSSION — Aquaculturists maintain that the key to successful production is stress management. Fish can be stressed by changes in temperature and quality of water, by handling, and by nutritional deficiencies. Stress increases the susceptibility of fish to disease, which can lead to catastrophic fish losses if not detected and treated quickly. Tilapia thrive in waters having a temperature of 82 F to 86 F. Tilapia grow much more slowly at a lower temperature and lose their resistance to disease when temperature fall below 70F. Tilapia cannot survive in water below 55F tilapia cannot survive in outdoor in North Carolina