

LABORATORY BLUEGILL CULTURE

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As an aquaculture technician, part of my job is to care for any Bluegill Sunfish (*Lepomis macrochirus*) that are in our facility. Of constant concern to us is the quality of pond-reared Bluegills we buy from fish hatcheries. Pond-reared fish are usually infested with external parasites when they arrive.

Before we send these fish to our clients they must be treated. This is done by holding them at a salinity of 5-10 parts per thousand for three or four days. Even when the fish come in clean of parasites, the handling and shipping process itself can cause excessive mortalities. Salt helps with this stress as well, but there are always some losses, both for us and our clients. For these reasons, I was given the responsibility of developing the methods necessary to breed and rear Bluegills at our facility.

My breeding tank is a 4'x8', 24-gal. fiberglass raceway. A separate biological filter that holds 100 pounds of gravel provides filtration. A magnetic-drive pump circulates water between the breeding tank and the filter at 200 gallons per hour. Heat comes from three 200-watt submersible heaters, and two 8' overhead fluorescent tubes provide light.

We purchased our brood stock from a hatchery in Indiana. The fish arrived in July, 1991 at the age of two years. The males are now 8"-10" long and the females range between 6" and 8". These fish are divided into two groups, each consisting of two males and six females. One group is always in the breeding tank, while the other stays in a separate 100-gal. trough.

We feed all fish Tetra Basic Flake twice daily. The fish in the breeding tank also receive a variety of frozen and live foods. This includes frozen adult artemia (brine shrimp), live juvenile Fathead Minnows, and live *Daphnia magna*.

Since the fish arrived, they have spawned more than two dozen times. Once they are put in the breeding tank, one of the males quickly establishes dominance. The dominant male will clean an area approximately 2'sq. on the bottom of the tank and actively chase other fish away. As females fill with eggs, he will chase after them and drive them back into his territory to spawn. Spawning activity takes place most frequently in the late morning. Spawn size has varied from as few as 1,000 eggs to as many as 10,000.

Depending on location, wild Bluegills will spawn from April to September. We keep our breeders on a 16/8 light cycle to simulate summer conditions. Under these lighting

conditions, our fish will spawn every two weeks for three or four months.

After a normal period of spawning in the wild, winter brings shorter days and cooler water. In the spring, longer days and warmer water stimulate a new spawning season. We have found that we can simulate this wintering process by cooling the fish down from 26°C (79°F) to below 20° (68°F). We also reverse the light cycle to eight of light and 16 hours of darkness. We hold our breeders like this for six weeks and then switch them back to summer conditions. By doing this, we cut the normal wintering period of six to eight months and get our fish spawning again faster.

Getting Bluegills to breed has never been a problem. The difficulty is in the rearing of the larval Bluegills. Bluegill larvae are 1mm-1.5mm long when they hatch. They are sac fry for three days and then they are ready to eat. Because of their small size and planktonic feeding habits, their first food must be very small. Our babies get *Selenastrum* sp. algae for the first one to two days, then rotifers are added. The fastest growth and highest survival are achieved when food is always in the water column. In my experience, Bluegill larvae cannot go for more than one or two hours without food.

After two weeks, newly hatched artemia are added to the feeding routine. After another week, algae and rotifers are discontinued. By this time, the young Bluegills have reached a length of 1cm-1.5cm and are ready to be sold.

I have learned a great deal about Bluegills while working on this project. Although we have had our share of problems, our breeding program is finally showing signs of commercial success.

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