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Largemouth Bass

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Fertilization and Feeding

Rearing ponds should be fertilized when spawning activity is first noticed. The goal is zooplankton production (copepods and cladocerans). Zooplankton is produced from organic materials directly added to the rearing pond or from phytoplankton. Inorganic fertilizers are usually added to stimulate phytoplankton growth but are not essential if enough organics are applied regularly. Some culturists do not use inorganic fertilizer because it can stimulate filamentous algal growth. Others believe phytoplankton blooms resulting from added nutrients enhance fry survival because of reduced visibility.

Organic fertilizers should have a low carbon : nitrogen ratio for quick decomposition. Cottonseed meal produces excellent results and is the most widely used organic fertilizer in bass rearing ponds. Cow manure and other animal manures will also give satisfactory results. A general rule is to apply 50 pounds of cottonseed meal/surface acre/week increments. Reduce applications if filamentous or bluegreen algae proliferates.

High phosphorus liquid inorganics such as 10-34-0 stimulate phytoplankton if correctly applied. Dilute liquid fertilizers with at least 10:1 water to prevent sinking to the bottom and stimulating filamentous algae growth. Apply 1 gallon/surface acre and repeat as necessary to maintain a green plankton bloom.

Largemouth bass don't normally take artificial feeds but can be trained to do so with considerable effort. This method has not been widely practiced but is useful in culturing larger fingerlings and "stocker" bass.

Fingerling bass 1.5 to 2 inches long must be crowded in tanks, raceways or cages for feed training. Grade closely to prevent cannibalism. Good water quality and disease prevention are essential. Crowding promotes competition for food and better acceptance of pelleted rations.

The fingerlings should be fed 1.0 to 2.5 mm diameter moist pellets at least 8 times per day, 7 days per week. Mixing ground fish with the feed improves acceptance. By reducing the amount of ground fish daily, the fish can gradually be weaned to a prepared diet. Researchers at San Marcos National Fish Hatchery and Training Center found that Biodiet™ produced excellent results. Feed at least 15 percent of body weight daily during the training period. Grading is periodically necessary to maintain uniformity and minimize cannibalism. Pellet size can be increased correspondingly to fish growth. From 65 to 95 percent of the initially stocked fish should learn to take prepared feeds and should double in weight before transferring to growout ponds.

Trained fish can be stocked in growout ponds in quantities of at least 10,000/acre, or can be reared in raceways or cages. Stocking density in intensive culture systems varies with exchange rate, oxygenation and filtration.

* Texas Agricultural Extension Service.

Floating mats, hay bales, flowing water or other methods to concentrate fish for feeding accelerates in-pond feed acceptance. Feed a 2 to 3 mm pellet several times per day for a week or more. Feed all that the fish will eat which should be about 15 percent of stocked weight daily. The rate will gradually drop to about 5 percent daily. When the fish reach about 4 inches, a high quality dry ration can be substituted to reduce cost. Bass should average 6 to 8 inches in length in about 100 days. More than 80 percent survival at 1.5 food conversion can be expected.

Stocking Broodfish and Fry

Largemouth bass begin spawning in early spring when water temperatures stabilize near 60° F. Reduced spawning can occur in late spring and early summer. Bass spawn as early as January in central Florida and February in southern Texas, but most spawning occurs in March and April in the southern United States.

Separating the sexes and holding them until the water stabilizes above 60° F produces a more uniform spawn. The fish from early spawns usually cannibalize later spawns, resulting in lower production.

Stocking rates depend on whether or not fry will be sold directly from the pond or transferred to other ponds for further growth. Stocking 30 to 50 pounds of broodfish/acre to produce 20,000 to 50,000 fry of 1.5- to 2-inch marketable size in the same pond is commonly practiced in private fish hatcheries. This method requires less labor, resources and technical expertise. Approximate equal weights of males and females should be stocked, which usually results in a higher number of smaller males.

Up to 125 pounds of broodfish per acre are stocked if fry are transferred to separate rearing ponds. Transferred fry are more uniform in size if individual schools are seined. Fry seines should be 1/32- or 1/16-inch soft mesh. Mud lines are not recommended. Seines 10 feet long and 4 feet deep are sufficient to surround the schools. The fry are corralled into a seine pocket and then either dipped into a tub of water with a fine soft-mesh net, or the seine pocket is reversed into the tub for transfer. Fry numbers can be estimated by water volume displacement or by weight-counting with accurate scales. Stock zooplankton-rich rearing ponds with 50,000-70,000 fry per acre to produce 1.5- to 2-inch fingerlings. Expect at least 20 percent loss. The need for fry uniformity cannot be overemphasized. Stocking mixed sizes results in poor survival from cannibalism. Depending on temperature and food availability, bass reach a harvestable size of 2 inches in 40 to 65 days after hatching.

Bass become cannibalistic when about 2 inches long, which makes rearing to larger sizes impractical for many culturists.

Unless larger fish are to be produced do not stock forage fish in the brood ponds as they interfere with bass reproduction and are difficult to separate from bass fry at harvest.

Spawning

Largemouth bass breeders can be collected from wild sources or purchased from commercial producers.* Wild fish will usually spawn during the first year of captivity but may not be as dependable as bass adequately fed in culture ponds. A thick tail, relatively small head and chunky appearance indicate good body condition. Good condition is essential because spawning and nest protection for several weeks without food is severely stressful.

** Check local regulations on collection and possession.*

Broodfish commonly lose 10 to 30 percent of their body weight during this period. Adequate food is essential, when the eggs are developing in the fall prior to spring spawning. Supplemental feeding of live forage (baitfish) is usually necessary. About 3 pounds of live forage per pound of body weight is needed for annual maintenance and 5 pounds is needed for growth. Bass will eat almost any fish that they can swallow but tilapia, goldfish and carps are commonly used because they can be produced in larger quantities at lower cost.

Goldfish commonly introduce anchorworm parasites which can be controlled with Masoten™ treatment according to label directions. Tilapia cost less to produce and don't normally transmit parasites but are not as available in the winter and spring. See SRAC Publication No. 141, Forage Species Production Techniques for culture information on these and other forage fishes.

Contrary to popular myth, broodfish held in impoundments that can't be

seined can be collected by electrofishing without causing reproductive damage.

Bass will usually spawn when 1 year old if they are at least 8 to 10 inches long, but 2-year-old fish are more dependable. Smaller bass (1 to 3 pounds) normally produce more eggs per pound of body weight than larger fish and are not as difficult to handle.

Sexing is easiest in early spring prior to spawning. Ripe females have a distended and soft belly and a red, swollen vent. The scaleless area surrounding the vent is pear-shaped in females compared to circular in males. The easiest and surest way to identify males is by squeezing the abdomen. Ripe males will emit a small amount of creamy white milt. Don't confuse with clear urine emitted by both sexes. If absolute certainty is necessary, insert a small capillary tube to detect eggs or milt.

Broodfish should not be subjected to low oxygen or sudden temperature changes when handling. Add salt to hauling water at about 2 pounds per 100 gallons. Handle with soft, wet nets or by the lower lip as much as possible.

Strain selection depends on market demand and suitability for your market area. Florida strains are popular in warmer southern areas because they apparently grow to larger maximum size. There is conflicting data on growth rates of Northern and Florida strains. Pure Florida strains are subject to winterkill, especially in shallow culture ponds during prolonged sub-freezing weather. A Cuban strain is being tested, but information on performance is not currently available. Positive strain identification requires sophisticated electrophoretic techniques. Contact your state Extension service for information on electrophoretic testing and strain recommendations for your market area.

Ponds should be rectangular shaped, free of obstructions and no more than 6 feet deep to facilitate harvesting.

Ponds should be drained and completely dried to eliminate predacious insects, fishes and diseases. Apply agricultural lime according to soil test if the pond bottom soil is acidic. Heavy lime applications will also harden soft soils which reduce mud and associated toxins in the harvest seine. If the pond has a history of submerged aquatic vegetation, apply an approved pre-emergent herbicide according to label direcions. Filamentous algae commonly interfere with fry harvesting if not controlled.

Fill the pond with well water or surface water filtered through 52 mesh/linear inch saran socks. Fill only a few days before stocking to reduce the buildup of predacious insects.

Economics of Fingerling Production

Largemouth bass fingerling production can be profitable if markets are available. Most fingerlings from private hatcheries are sold to private lakes and fishing clubs. Competition from public hatcheries limits markets in some states. Some producers market bass wholesale to fingerling distributors.

Since 1 1/2- to 2-inch bass fingerlings are subject to severe cannibalism, it is critical to harvest and sell them as soon as they reach marketable size. Wholesale arrangements must be made in advance if all the production cannot be sold retail in a short period of time.

Production costs vary with the techniques used. Bass production is normally only a part of a sportfish fingerling operation. Costs must be prorated among species to estimate return on investment. Market success and price largely determine profitability.

The following is a sample budget for a 1-surface-acre bass production pond. Equipment costs are prorated for a 20-acre sportfish fingerling operation. A simple production system of stocking broodfish and rearing fingerlings in the same pond follows. This technique gives variable results but is usually successful using minimal labor and technology. The production is sold wholesale. Selling retail would more than double returns.

Projected Income and Expenses from Largemouth Bass Fingerling Production in 1- Surface-Acre Pond

Projected income

30,000 1.5- to 2-inch fingerlings @ $0.10 ea	$3,000

Expenses

Variable costs

Broodfish (40 lbs @ $5.00/lb)	200
Cottonseed meal (500 lbs @ $10.00/100 lbs)	50
Water pumping (4 ac/ft @ $30 ac/ft)	120
Pre-emergent herbicide (5 lbs Aquazene™)	45
Labor (75 hrs @ $5.00)	375
Fuel	100
Total variable costs	**$ 890**

Fixed costs

Depreciation	
Pond construction ($4,000-10 yrs)	400
Truck, one ton	200
Service roads	10
Well/pump	200
Seines	10
Transport tank	2
Holding facility	50
Other equipment	5
Total fixed costs	**$ 1,437**

Other costs

Insurance	50
Taxes (except income tax)	10
Interest on capital outlay	500
Total costs	**$ 2,327**

NET RETURN TO MANAGEMENT $673

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