

## Fertilizing Recreational Fish Ponds

As in agricultural situations, liming and fertilizing fish ponds will dramatically increase the production of the system. A fertilization schedule can dramatically improve fish production in ponds by up to 300 percent, and fertilization can also decrease aquatic weed problems by shading the pond bottom, so that aquatic weeds do not have an opportunity to grow. A well-managed recreational fish pond that has a good fertilization program can sustain harvests of 125 pounds of fish per acre per year for a number of years.

Not all ponds need to be fertilized. Those ponds with muddy water, black water ponds where an object cannot be seen at a depth of 18 inches, or ponds with very low pH where liming is not possible, do not need to be fertilized. If the pond has aquatic weed growth it should not be fertilized since the fertilizer will only increase growth of the existing weeds and will not be beneficial to phytoplankton. Aquatic weed control should be initiated before fertilization is attempted. If the pond is a flow-through system where water exchange exceeds 5 percent per day by volume, you will be unable to fertilize the system properly.

If you are artificially feeding with prepared food, the excess feed and excess nutrients from the fish act as fertilizers and no fertilization program is needed. In fact, artificially feeding recreational ponds at high levels can cause excess planktonic algae blooms and potentially low dissolved oxygen and fish kills if the feed rates are not precisely adjusted. If you wish to have a clear water pond you should not fertilize, but the risk of aquatic weed growth due to sunlight penetration to the bottom is increased. Remember that a properly limed and fertilized fish pond can produce at least 300 percent improvement in fish production if properly

managed. If you do not plan to fish the pond heavily you may not wish to fertilize.

Just as in terrestrial agriculture, the pH of a recreational fish pond adjusted by lime applications must be attempted before a fertilization program can be initiated. Fertilizer activity is dramatically affected by proper adjustment of water chemistry. When ponds are limed, the pond bottom or soil is limed. When a pond is fertilized, the water column is fertilized.

Before fertilizing you must adjust your pond alkalinity and water hardness to a minimum of 20 mg/l or parts per million. Since most of South Carolina has soft water, an agricultural limestone application will be needed. Typical lime applications range from 1 to 4 tons per acre. Lime applications can be determined by water samples, but can be more accurately determined from a pond mud sample analyzed through the Extension Service. Lime must be applied at a minimum of four to six weeks prior to fertilizing. If lime and fertilizer are applied simultaneously, the calcium in the lime will bind with the phosphorus and make it unavailable for use. More information on liming fish ponds is available in [HGIC 1711, \*Liming Recreational Fish Ponds\*](#).

### Why Fertilize?

Fertilization of a fish pond actually increases the production of beneficial phytoplankton, microscopic free-floating algae that acts as the basis of the food chain. By increasing the phytoplankton in a pond, more food items are available for smaller fish. This increases productivity, thereby increasing the amount of harvestable fish. The harvest of a fertilized pond can be triple that of an unfertilized pond.

## Types of Fertilizer

The ratio on inorganic fertilizers represents the percentage of nitrogen, phosphorus and potassium available in the fertilizer. A 20-20-5 fish pond fertilizer is 20 percent nitrogen (N), 20 percent phosphorus (P2O5) and 5 percent potassium (K2O) by weight. The remaining percentage is inert material and binders. Phosphorus is generally the limiting nutrient in ponds; little nitrogen and usually no potassium is generally needed. In older ponds or ponds with inputs of animal waste such as waterfowl or wading bird rookeries, phosphorus-only fertilizers should be used since these ponds usually have excess nitrogen input.

Only inorganic fertilizers should be used in recreational fish ponds. Organic fertilizers, particularly animal manure, can cause major water quality problems and excess filamentous algae growth will lead to unsightly ponds and fish kills. Most fertilizers with the proper nutrient analysis can be utilized in farm ponds; however, certain fertilizers contain pre-mixed pesticides and should not be added to ponds.

Two types of fertilizer formulations are available for use in South Carolina. Solid formulations, either granular or powders, must be allowed to dissolve in the water. Solid fertilizers must not come into contact with the pond bottom since the nutrients will bind with the soil and be ineffective in fertilizing the water. Liquid and highly water-soluble powder fertilizers are also available and can be distributed over the water. These liquid and highly water-soluble fertilizers have a quicker reaction time than the granular fertilizer formulations but may not have as lasting effects.

## How to Apply Fertilizer

There are several methods of applying solid fertilizer, but in each method you are applying the fertilizer to the water. Fertilizer may be applied on a fertilizer platform suspended 18 inches to 2 feet deep in a pond. One 5-foot x 5-foot platform will serve up to 5 acres of water. Fertilizer bags can be opened and poured directly onto pieces of tin or plywood directly on the bottom 1 to 2 feet deep. Or, fertilizer bags may be opened on one side, with the unopened side in contact with the bottom. The bags are then staked in shallow water 1 to 2 feet deep. In each application method, water circulating over the fertilizer dissolves the fertilizer, but the

impermeable bottom does not allow the fertilizer to bind with the pond bottom. Solid fertilizers are not broadcast over the water since the fertilizer granules are heavier than water and would bind with soil particles and not produce any beneficial effects and possibly increase aquatic weed growth.

Liquid fish pond fertilizers are heavier than water and must be mixed at a rate of 10 gallons of water to 1 gallon of fertilizer before broadcasting over the water. Pond managers should remember that liquid fertilizers react much faster than granular fertilizers.

Highly soluble powder fertilizers can be applied as liquid fertilizer by combining with water and distributing the mixture over the water.

Pond fertilization should begin in March and early April initially or when water temperatures reach 60 °F in South Carolina. After the initial application of fertilizer, managers should wait 10 days to two weeks before establishing whether or not another application of fertilizer is needed. Pond fertilization should continue until an object cannot be seen 18 inches under the water. Ponds should be sampled on a bi-weekly basis to determine if more fertilizer is needed throughout the spring, summer and fall. Most ponds will need to be fertilized at least three times per year. Fertilization can continue until water temperatures return to 60 °F in September or October. Fertilization during cooler months has no effect and may cause filamentous algae problems the next spring. Over-fertilization should be avoided since excess fertilization can cause reduced nighttime dissolved oxygen levels, which, in turn, can cause fish kills.

## Fertilization Rates (Per Application) for Various Fish Pond Fertilizers in South Carolina

Fertilizer		Application Rate Per Acre
Type	Analysis	
Granular	20-20-5	40 pounds
	0-46-0	4-8 pounds
	0-20-0	8-16 pounds
Liquid	10-34-0	½-1 gallon
	11-37-0	½-1 gallon
	13-37-0	½-1 gallon
Powder	12-52-4	4-8 pounds
	12-49-6	4-8 pounds
	10-52-0	4-8 pounds
Time Release	10-52-0	25 pounds
	14-14-14	75 pounds

## Safety

Fertilizers are formulated from caustic chemicals and care should be taken when applying them to avoid contact where possible. Protective eyewear and clothing is recommended when applying fertilizers and drift should be avoided. Fertilizers are corrosive on most metal compounds and equipment should be thoroughly cleaned after each application. Since applications take place around water, basic water safety should be practiced.

Excerpted in part from *Fertilization of Fish Ponds*, Brunson, M.W., N. Stone and J. Hargreaves,

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