

Liming Recreational Ponds

South Carolina is noted for infertile, soft waters, low in pH, alkalinity and water hardness except in specific coastal areas. Just as in farming or gardening, proper liming ensures greater production through improving the activity of fertilizer. Liming fish ponds also improves several important water quality parameters. Liming increases the pH of the water column and also buffers pH fluctuations by improving water hardness and alkalinity.

Liming is important in fish ponds since the proper water pH is 6.5 to 9.0, much higher than that needed in terrestrial systems. Low water pH can reduce and later stop fish reproductive success, and dramatically high or low pH can cause fish kills. Liming fish ponds will adjust the pH and alkalinity so that fertilization will increase pond productivity, increasing fish production by about 300 percent and improving water quality for fish.

Determining Lime Requirement

There are two methods for determining liming needs: (1) pond water can be checked for alkalinity and/or hardness with water quality test kits and adjusted to reach a hardness and alkalinity of 20 parts per million calcium carbonate; (2) for a more precise determination, pond mud samples can be analyzed by the Clemson University Cooperative Extension Service Soil Testing Lab to adjust the pH of the soil to allow for proper water quality. The fee for the pond mud sample is \$3.00. Eight to 10 mud samples should be collected from throughout the pond bottom. In deeper water a pole with a can or bucket attached can be used to collect samples. All the samples should be combined, mixed and dried before taking a full pint sample to your local Extension office for analysis. When liming a pond, you actually are liming the pond bottom, not the water itself.

Lime Types

Only agricultural limestone should be applied to recreational fish ponds. Generally dolomitic lime is used, but if high quality calcitic lime or calmag lime is available and cheaper, they may be used. Hydrated lime, slaked lime, slag, builders lime and burnt lime have been incorrectly recommended as a pond liming material. These forms of lime are short-lived and react rapidly, causing water quality problems. This, in turn, can cause fish kills from levels that are too high.

Lime Application

The best time to apply lime is in fall or winter. Limestone takes four to six weeks to adjust water quality. Ponds should not be limed and fertilized simultaneously since the calcium in lime will bind with phosphorus in fertilizer and make phosphorus, the limiting nutrient in ponds, unavailable for use. Lime is applied to the pond bottom soil, not the water, so limestone should be evenly distributed over the bottom of the pond. It is best if lime is applied immediately after pond construction, before ponds are flooded. Mechanized agricultural lime spreaders can be used at this time and greatly reduce manual labor. After the pond is filled, mechanized equipment can continue to be used, if the pond is small and there are very few obstructions around the pond or if the spreaders can cover at least 60 percent of the pond bottom. If 60 percent coverage is not possible, lime will need to be floated into place on a pontoon boat, barge or two John boats tied together with 4 x 8 sheets of plywood across. Pile the lime on a barge system and distribute it by either shoveling it off throughout the pond or by washing it off with a portable water pump.

Generally, liming is good for three years. It is virtually impossible to over-lime a pond with agricultural limestone since lime adjusts soil to a maximum of pH 8.6, which is below the upper limit of 9.0 for good fish health. Excess liming will only improve water quality by increasing hardness and alkalinity. Generally, liming a pond will increase the alkalinity of the pond to 20 parts per million. In some instances, however, alkalinities of 50 parts per million are needed for applications of copper herbicides in ponds and additional lime over the recommended rate from a pond mud sample may be needed. The only times liming will not benefit recreational fish ponds are in specific instances where the flow-through of water in the pond is so rapid that the alkalinity and pH cannot be changed, the pond is in a coastal area with naturally hard

water due to high calcium carbonate pond bottoms from shell deposits, or in ponds filled from certain deep wells which have high alkalinity and low hardness.

Prepared by Jack M. Whetstone, Extension Aquaculture Specialist, Clemson University, and Mac Watson, South Carolina Department of Natural Resources. (New 02/01.)

This information is supplied with the understanding that no discrimination is intended and no endorsement by the Clemson University Cooperative Extension Service is implied. All recommendations are for South Carolina conditions and may not apply to other areas. Use pesticides only according to the directions on the label. All recommendations for pesticide use are for South Carolina only and were legal at the time of publication, but the status of registration and use patterns are subject to change by action of state and federal regulatory agencies. Follow all directions, precautions and restrictions that are listed.