

LIMING FARM FISH PONDS IN EAST TEXAS

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Most farm ponds in east Texas have slightly acid water which reduces fish production. Some other ponds are so acid fish die soon after stocking. Spreading sufficient quantities of agricultural limestone over the pond bottom will correct these problems.

Liming ponds prevents stress on or death of fish caused by low pH. Most important, lime increases the availability of phosphorous for plant use. Phosphorus promotes growth of algae, microscopic plants which are the base of natural fish food production in ponds.

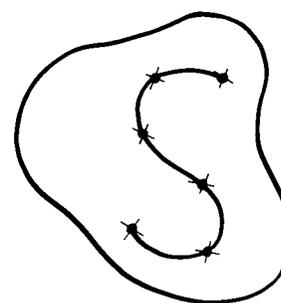
Another benefit of liming is it increases water alkalinity which in turn increases the carbon dioxide available for photosynthesis by algae. Liming a fertilized, acid-water pond can increase fish production.

Need

Ponds with waters of less than 20 parts per million (ppm) total alkalinity, or with pH below 6.5, normally need lime. Generally, the farther the water is below 20 ppm total alkalinity, the better the pond will respond to lime applications. Total alkalinity can be determined with a simple water testing kit available from fish farming supply houses. The total alkalinity test indicates whether a lime application is needed. A chemical analysis of the bottom mud determines the quantity of lime required.

Mud samples are easily collected from dry ponds. Since the lime requirement of mud from shallow areas is generally less than that of mud from deep areas, take samples randomly in an S-shaped pattern along the length of the pond (Figure 1). Take three to six samples of equal volume, about 1 cup per acre, from ponds larger than 5 acres and a minimum of 10 samples per acre from small ponds.

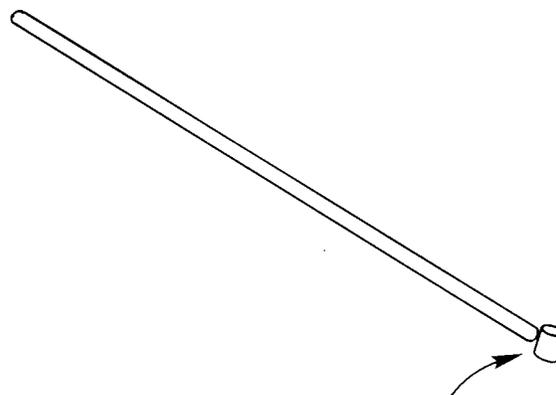
Soil samples can be taken in a full pond by using a boat and a sampler made by attaching a can to the end of a long pole (Figure 2). Follow the same sampling procedure described for dry ponds. Mix individual



Sketch—X indicates sample points.

Figure 1. Mud sampling locations in a pond.

samples together in a container. Then, spread the combined sample on aluminum foil to dry. After drying the sample, gently pulverize it; then place it in a soil testing box. Soil sample boxes, information sheets and instructions are available at your county Extension office. Clearly write "Fishpond" on the soil information sheet and soil box and send the sample to the address on the box. A minimal fee is charged for the analysis. The lime recommendation will be stated in tons of agricultural limestone per acre.



Small can nailed to pole at least 10 feet in length.

Figure 2. Mud sampler for use when pond is full of water. Can be used from a boat or from the shore.

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Materials

The most common pond liming materials are agricultural limestone (calcium carbonate or dolomitic) and slaked or hydrated lime. Pure calcium carbonate has a 100 percent neutralizing value. Other liming materials are measured against this standard. Dolomitic limestone ranges from 95 to 108 percent; slaked lime is 136 percent; and basic slag has a neutralizing value of about 50 to 79 percent. Do not use silicate slag in fishponds. Lime must meet the state fineness standard which regulates its reaction rate in the mud.

Agricultural limestone is best for fishponds. Slaked lime can raise the water pH so high that fish may die. If fish are not present, slaked lime may be used provided fish are not stocked until the pH returns to a tolerable level, possibly several weeks. Liquid lime, a finely ground suspension of agricultural limestone, may be convenient to apply, but normally has about one-half ton of actual lime per ton; therefore, twice as much liquid lime by weight is required per acre as regular agricultural limestone.

Requirements

To calculate the amount of liming material required, divide the lime requirement by the neutralizing value. For example, suppose your soil test analyst recommends 2 tons of agricultural limestone per acre and the liming material you have selected has an 85 percent neutralizing value. Two tons divided by .85 equals 2.4 tons of liming material needed per acre.

Application

New ponds or ponds with the water removed can be limed before they are filled. Spread the required amount of limestone evenly over the dry pond bottom. A disk harrow can be used to mix the lime into the soil. This will speed the lime's reaction with the soil. In ponds which contain water, apply limestone evenly across the surface. In small ponds, distribute bagged limestone from a boat. In larger ponds, where several tons of lime are required, a platform can be constructed on the front of a large boat or between boats lashed together (Figure 3). Bulk limestone can be loaded on the platform and distributed across the pond surface with a shovel. Do not overload the boat or it may capsize.

If spreading the lime over the pond surface is impractical, pile the liming material in the water along the shallow pond edges or dump it into a feeder stream. Wave action and currents will help dissolve the material and spread it through the pond. Results are not very predictable using this method.

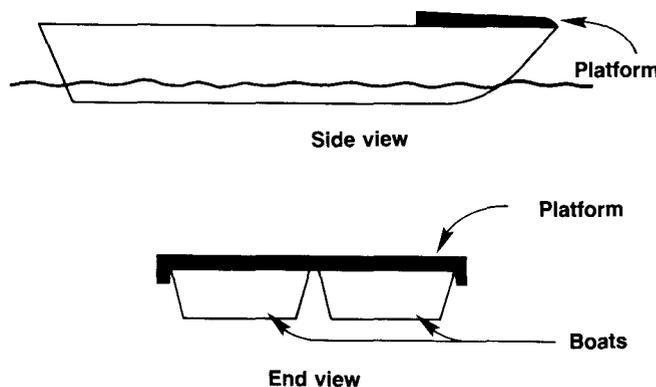


Figure 3. Boats lashed together to form floating platform for applying lime or fertilizer.

Timing

The best times for lime application are during late fall and winter when fertilization is suspended. This allows the lime to react with the acid bottom muds before the spring fertilizer application. Do not apply limestone while the pond is being fertilized. Limestone settles phosphorous from the water, making it unavailable to algae.

Frequency

A liming treatment will last almost indefinitely if no pond water outflows. Most ponds, however, have excess water which flows through the spillway or pipe sometimes. Seepage, pond draining and use of acid forming fertilizers also increase the required liming frequency. Most ponds in acid soils with moderate water outflow will require lime every 3 to 5 years. To continually satisfy the lime requirement, initially apply the total amount needed and then apply one-fourth that rate each year.

This material was adapted in part from *Liming Fish Ponds* by John Jensen of the Alabama Cooperative Extension Service and used with his permission.

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