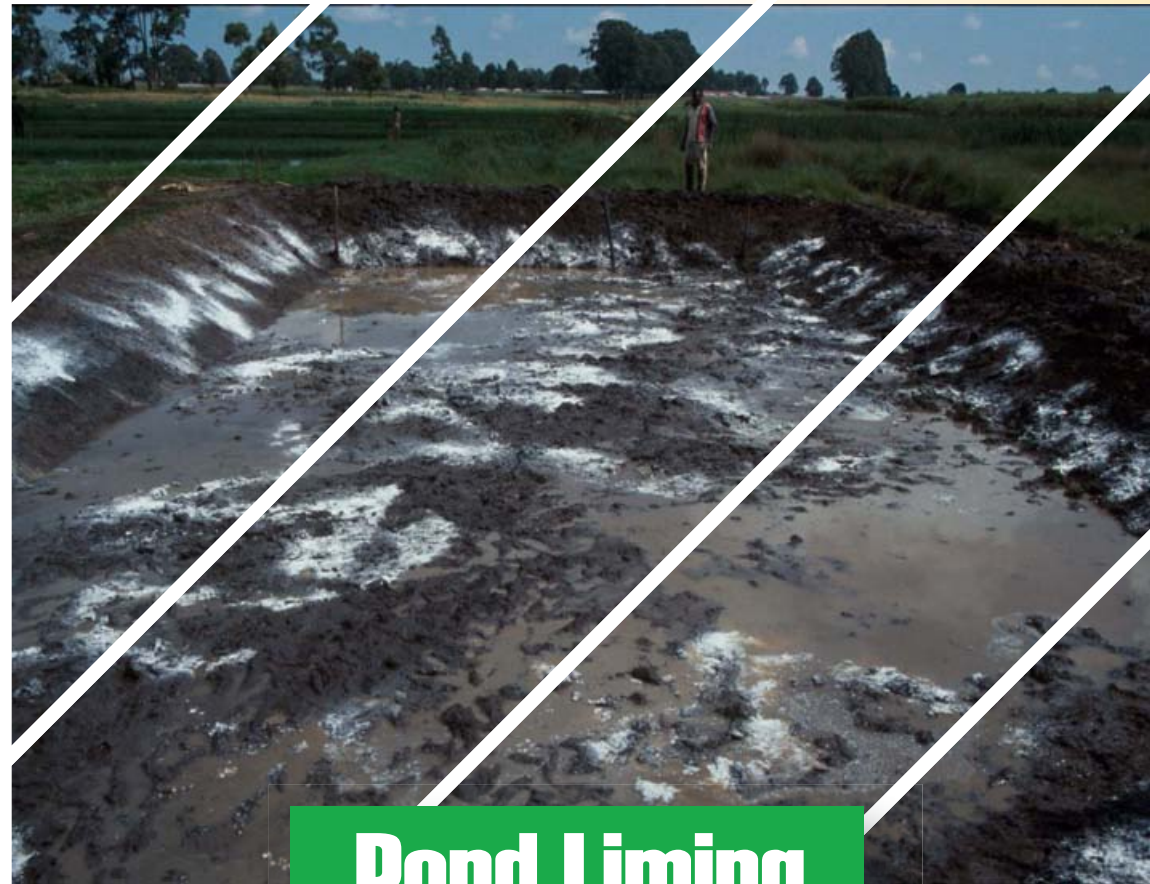


Pond Management



Pond Liming



Liming your Fish pond

Introduction

In Fish farming, efficient operations and increased production can only be realized if fishponds are well managed. Pond Management includes liming, fertilizer applications, well stocking ponds, feeding, water quality maintenance, disease and predator control, and proper harvesting. It is also important to keep pond records by sampling fish so as to monitor growth and condition of your fish.

Let us start by talking about liming at the first step in pond preparation and management soon after construction. When ponds are built, the top soil is alkaline and fertile. However this soil is removed and the soil left to build dykes is less alkaline and in some cases very acidic. Ponds built in areas which have acid soils and soft water may not always perform well for fish production. Such ponds may benefit from liming if the water has a total alkalinity of less than 20 mg/l.

Why Lime your fishpond?

If a fish farmer applies fertilizer and the pond does not bloom (i.e. green water colour due to the growth of phyto and zooplankton) within seven days the problem could be that the pond water is low in alkalinity (is acidic) and thus requires liming. Clay soils are often acidic and because ponds are commonly constructed on these soils, they have low alkalinity and hardness and so require liming. If your pond is in a dry area, that is, one with little rainfall, you may not need to apply lime to it because the pH is already high.

Note you can buy simple cheap test papers or slightly more expensive water test kits which will tell you how alkali or acid (measured as pH – 1 very acid ,12-14 very alkali) your soil and also your water is.

The water test kits will also allow you to measure other key water quality parameters. Such water quality kits are well worth buying for fish farmers. Please consult your local Aquashop owner for advice.

What is lime and what type should I use?

The lime used in fish ponds include:

- Agricultural lime, CaCO_3
- Hydrated lime, $\text{Ca}(\text{OH})_2$
- Quicklime, CaO



- Liming is an effective tool in fish production and pond management.
- Agricultural limestone refers to calcite (calcium carbonate) and dolomite (calcium magnesium carbonate).
- You should always choose agricultural limestone (CaCO_3) for application in your fishpond. You can also use Hydrated lime ($\text{Ca}(\text{OH})_2$) which is an inexpensive and effective pond sterilizer. However, it is known to raise the pH quickly and dramatically above tolerable levels for most aquatic organisms.
- The carbonate component raises the alkalinity and the pH of the water while the calcium and magnesium components raise the hardness of water, essential to the health of many aquatic species.

If agricultural limestone (CaCO_3) is not available in your area, please consult your, Aqua shop agent, fisheries officer or extension agent about the possible use of other liming materials. Always wear gloves when working with any kind of lime.

Liming is applied to a pond to:

- (1) Correct/ modify water/soil acidity
- (2) Supply calcium (as Ca^{2+}) and carbonates thus increasing carbon dioxide in water and also assist in decomposition of organic matter.
- (3) Prevent wide fluctuation of pH by establishing a buffer of CO_2 - CHO - CaCO_3 .
- (4) Counteract toxic effect of excess magnesium, sodium and potassium ions.
- (5) Fix humic, sulphuric acids and other harmful acids.
- (6) Avail potassium and phosphate ions by reacting with manure applied in the pond
- (7) Act as prophylactic by killing unwanted fish, bacteria and other fish parasites.

Determining the amount of lime to apply to a pond

The amount of lime needed in a particular pond depends on the acidity of the pond soil, the type of liming material to be used, and the quality of the liming product that is available. If you are not sure of the alkalinity or soil pH of your pond, start by using the lowest recommended amount from this table, i.e., apply 1,000 kg of limestone per hectare of pond surface area. (One hectare = 10,000m²)

Apply the amount of agricultural lime as shown in the following table below, depending on either the total alkalinity of the pond water or the pH of the soil.

How do I apply lime to my pond?

You can add lime in the pond by:

- (a) Spreading the powder on dry pond using a shovel.
- (b) Sprinkling in solution form
- (c) Spraying with a container

Apply lime to the pond bottom and dike slopes. Distribute the powder as evenly as possible around the pond bottom and on the slopes of the dikes. When applying the lime please take care to keep the powder or liquid away from the operators eyes . The operator should also wear protective gloves and if applying as a powder then also wear a face mask.

If the Total Alkalinity (mg CaCO_3/L) is	If the Soil pH is	Apply this amount of lime
< 5	< 5	3000 kg/ha
5 - 10	5.0 - 5.4	2500 kg/ha
10 - 20	5.5 - 5.9	2000 kg/ha
20 - 30	6.0 - 6.4	1500 kg/ha
30 - 50	6.5 - 7.0	1000 kg/ha

If you are not sure of above then check with your extension officer or local Aquashops owner for what is best suited for your pond