

# **FISH POND FERTILIZATION TECHNIQUES**

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Bolorunduro P.I.

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## 1.0 INTRODUCTION

A fish pond is a unique environment created by man. It must be managed properly to achieve profitable production. Fish farmers in different countries have increased fish yields in ponds by using inorganic and organic fertilizers or manure.

Microscopic green plants called algae or phyto- plankton form the base of the food chain for fish. All green plants need light, proper temperature and nutrients for growth. If sufficient light and proper temperature are present, the nutrients in chemical fertilizers (nitrogen, phosphorous, and potassium) are readily assimilated by phytoplankton and their abundance increases. Manures contain the same nutrient. The concern of every fish farmer would therefore be how to ensure abundant production of natural foods to meet the demands of the fish for maximum growth and production.

The type of soil a fish pond is located in determines to a large extent pond fertility, fish production and ease of management of a fish culture enterprise. Soils in fish ponds play three vital roles:

- i. Supply of the necessary nutrients to grow the desired quantity and quality of fish food.
- ii. As a medium for holding pond water and providing a base for nutrient growth
- iii. Production of the bottom algae.

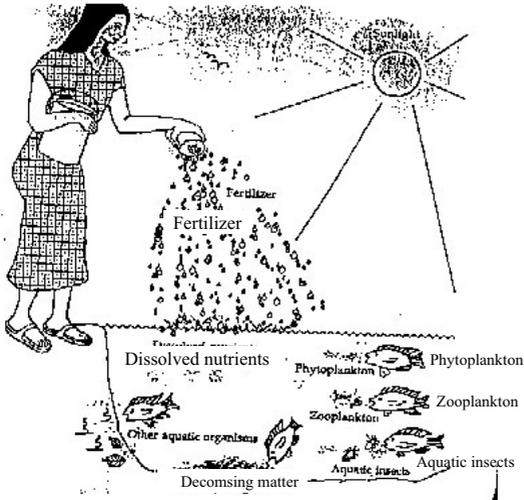
A relationship exists between soil types and growth of algae in most fish ponds. Soils with high clay (50% clay, 22% silt) and silt content (42% clay, 44% silt) are most desirable for fish ponds. Soils of the loam, silty loam, clay loam or soils with high clay content are relatively more fertile than sandy soils. Undesirable soils can be improved upon through the addition of organic matter which is regarded as the reservoir of nitrogen in the soil. As nitrogen in organic matter is released, algae use it to grow. The growth of these fish foods is generally determined by the fertility of the pond bottom soils and this can be improved upon by fertilization. It is therefore very essential that practicing and prospective fish farmers know the types and quantities of fertilizers suitable for fish pond to guarantee proper fish growth, yield and enhanced revenue.

## **2.0 REASONS FOR FERTILIZING PONDS.**

Generally, in agriculture fertilizers are used to increase farm productivity in order to make farming ventures profitable. The essence of fertilizing is to augment minerals needed by the plant, but not adequately available in the soil.

In fish culture, fertilizers are also important in increasing pond productivity. Both inorganic (chemical) fertilizers and organic (plant and animal materials) fertilizers are useful in fishponds to stimulate and augment natural productivity. The following are some of the major benefits that can be derived in fertilizing pond water.

- i. Microscopic green plants called algae or phytoplankton form the base of the food chain for fish. Fertilizers, when applied serves as nutrients for their growth. As phytoplanktons multiply they are eaten directly by some fish or by other mostly microscopic aquatic animals called zooplankton. However, some fish feed directly on zooplankton. Planktons serve as food for larger aquatic animals that are in turn eaten by fish.
- ii. When ponds are well fertilized a farmer spends less on artificial feeds in augmenting food in fishponds.
- iii. Since the essence of business ventures is profit, a farmer stands to gain in applying fertilizers to fish ponds. Large size fish will be harvested as opposed to stunted fish when nutrients and food in pond water are not adequate.
- iv. Fertilizers increase the chances of maximizing pond productivity in terms of fish species stocked under polyculture. Different fish may have different food preferences some can filter plankton, others eat aquatic insects and others may feed on decomposing materials (Figure1).

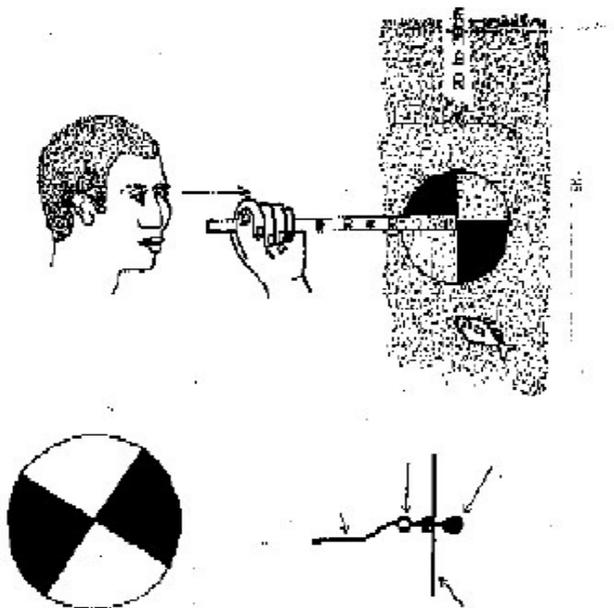


**Figure 1. Fertilization increases the abundance of natural food.**

A farmer measures the effect of fertilization by the abundance of phytoplankton. When phytoplankton is abundant, the pond water will be greenish in color. Plankton abundance can serve as a measure of fertilization. Deep green color indicates excessive plankton occurrence. This may be dangerous if not properly managed, since dissolved oxygen (DO) in water may be used up for photosynthesis activities by phytoplankton at the expense of its availability to fish. Light green coloration of pond water indicates optimal fertilization. In this case fish are not endangered. Brownish or pale coloration indicates under-fertilization of pond water. Such a situation will not augur well for fish growth.

Plankton abundance can be measured in pond water through the use of a Secchi disk.

The use of Secchi disk is a standard way to measure visibility (transparency) in water. The disk measures 20cm in diameter and painted black and white in opposing quarters as shown in Figure 2. The farmer can make the disk from a round can lid or good wood and attach it to a wooden stick or a rope marked off in centimeters. Transparency or plankton density is measured by lowering the disk into the water with the observer's back to the sun while viewing the disk directly from above. The depth at which the disk just disappears from sight is the Secchi disk reading.



**Figure 2. Making and using a Secchi Disk.**



















































