Aquaculture

THE PROBLEMS FACING WATER QUALITY IN AQUACULTURE

Intensive aquaculture produces a series of problems that need to be carefully managed to be able to achieve a successful long lasting operation.

The problems are:

o High BOD (Biochemical Oxygen Demand) due to the dense fish excrements

o Dissolved Oxygen can affect the pH. and Alkalinity, depleted oxygen will cause negative bacterial activity

o Relation between NH_3, NO_x, N_2, P and the BOD
o Taking care of the Phytoplankton (phytoplankton is desirable)
o Water turbidity (it is desirable to maintain a degree of turbidity in the water)

o Mineralization and degradation of the organic material especially waste which mineralizes aerobic nutrients, which are responsible for the accumulation of CO_2 nitrates, (unless they attach themselves to simple organisms like phytoplankton) or complex organisms that will result in a solution such as phosphates

o Elimination of nutrients to avoid effluents with high level of N and P

o Algae growth and algae's mucus control
o Formation of biofilm in the ponds
o Keeping all of the above in balance and harmony

ERGOFITO AQUACULTURE APPLICATION:
The first step in using Ergofito H2O culture to decompose fish excrements and nutrients is to calculate the quantum required based on the BOD.

As a general rule, the production of 1 Kg of fish will produce 1 Kg of waste. The important waste parameters are:

- Ammonia-N
- Nitrite-N
- Phosphate-P
- Suspended Solids
- Biochemical Oxygen Demand (BOD)

- Chemical Oxygen Demand (COD)

COD is directly proportional to the aeration system installed. It is important to note that Ergofito is composed of aerobic bacteria and will require a minimum Oxygen level to live.

The remainder can be managed by the application of Ergofito H2O culture. BOD is generally 7,5% of the solids.

Ergofito H2O culture facts:
- Applying Ergofito will decompose excrements and nutrients residues alike in the natural manner.

- Ergofito does so, by eliminating the causes, which alters water quality.

- Oxygen is used by the bacteria in Ergofito to decompose the excrements and food residues. Levels of Oxygen in the water need to be monitored (in mg/L). This is important in the event of excess of nutrients in the water, thus reducing Oxygen levels for the fish.

- Ergofito helps maintaining the correct pH at optimal level.

- Ergofito bacteria transforms Ammonia and Nitrates into proteins which forms into mud flakes, thus removing same from the fish (the major threat for fish are Ammonia and Nitrates) Phosphorus end up in the mud and the BOD is rapidly reduced.

- Ergofito has no effect on Phytoplankton
- Slime, biofilm and mucus are eliminated with the use of Ergofito

---

Please direct any queries to: cheyne@advanceagrisol.com
+27 82 678 0070

Filtering & aquatic plants:

Obviously water management is a combination of the filter, beneficial bacterial activity (Ergofito) and if possible the use of aquatic plants to absorb the N and P from the effluent.

Allowing floating plants (usually used in aquaculture ponds) like Lemna Minor and Acquariofilia Consapevole, will reduce water turbidity, absorb all nutrients and create sufficient shade to curtail photosynthesis for algae growth. Ergofito converts all excrements and nutrients residues in bottom mud, thus creating an active mud filter. The filter will act as a percolator and will ensure that no solids return to the pond.

The above combination calls for a simple and inexpensive percolator type filter. Water will never need to be replaced, only to top up the evaporation losses.

Ergofito H2O Application Tables and Dosages:

The table below indicates the correct dosage for a 20 000m3 aquaculture pond with a specified amount of fish and the results therefore.

DESCRIPTION	QUANTUM
Volume of pond	20 000m3
Initial fish weight	6000kg
Total fish produced	80 000kg
Feed required	60 000kg
Excrement produced	60 000kg
Bottom mud produced	1 500kg

Ergofito H2O Application at the Beginning of the Cycle:

PRODUCT	WHEN	HOW MUCH
Ergofito H2O	On the first day	6 Kg
Ergofito H2O	On the second day	6 Kg
Ergofito H2O	On the third day	6 Kg
Ergofito H2O	Once every week	2 Kg

The above applications are a total of 18 Kg initially plus 104 kg per year; this is a total yearly application for the above of 122 Kg of Ergofito H2O.

This translates to 1.5 grams of bacteria per Kg of fish produced.

Please direct any queries to: cheyne@advanceagrisol.com
+27 82 678 0070

Ergofito H2O Application Mid Cycle:

DESCRIPTION	WHEN	HOW MUCH
Ergofito H2O	On the first day	20 Kg
Ergofito H2O	On the second day	20 Kg
Ergofito H2O	On the third day	20 Kg
Ergofito H2O	On the fourth day	20 Kg
Ergofito H2O	On the fifth day	20 Kg
Ergofito H2O	Once every week for 10 Weeks	6 Kg
Ergofito H2O	Once every week for 16 Weeks	3 Kg

When starting at mid-cycle, to counteract the un-decomposed accumulation from the first half cycle. 100 Kg dosage is applied over five days.

Please direct any queries to: cheyne@advanceagrisol.com
+27 82 678 0070

Ergofito H2O Application in Case of Severe Sickness: (when Ergofito H2O was never used previously).

DESCRIPTION	WHEN	HOW MUCH
Ergofito H2O	Immediately	100 Kg
Ergofito H2O	Next Day	100 Kg
Ergofito H2O	Next Day	100 Kg
Ergofito H2O	Once every week for 5 Weeks	20 Kg
Ergofito H2O	Once every week for 16 Weeks	3 Kg

The above quantum of Ergofito H2O can be reduced if the water is filtered through a biological filter used in conjunction with Ergofito H2O as part of the overall filtration.

Daily dosage regulator:

Ammonia in the water can be simply measured, however the presence of Ammonia in water will raise its alkalinity. This can be used as a guideline for the application of Ergofito H2O culture. Although the application of Ergofito H2O culture will stabilize the pH excess of NH3 in water will eventually prevail and alter the pH The variants on the type of fish, amount of nutrients and water filtering will all affect the quantum.

In the same way, should the pH become more acidic, reduce the amount of Ergofito H2O culture to suit. The above will guide the quantum.

The above explanation is valid for aquaculture in the salt or in fresh water. Obviously if aquatic plants are used, the correct selection of salt or fresh water plants must be used.