

DPA System Improves Water Quality and Reduces Water Usage at Singapore Fish Farm

Challenge

There is a leading importer, exporter and wholesaler of ornamental fish in Singapore and it is located in the northeast region of the country. Contamination such as fish excrement, decomposition of dead animals (such as the fish itself) and decomposition of unfinished fish feed lead to an increase in the levels of organic nutrients such as nitrate/ phosphate. When temperature and nutrient levels are optimum, there could be uncontrollable algae growth, leading to "algae bloom."

Algae blooms are likely to lead to an oxygen reduction within ponds. Low dissolved oxygen (DO) levels result in higher fish mortality, either directly or indirectly, than all other problems combined. Thus, aqua culturists usually have to use huge volumes of water in their operations as they have to maintain the quality of water at an acceptable level.

Solutions

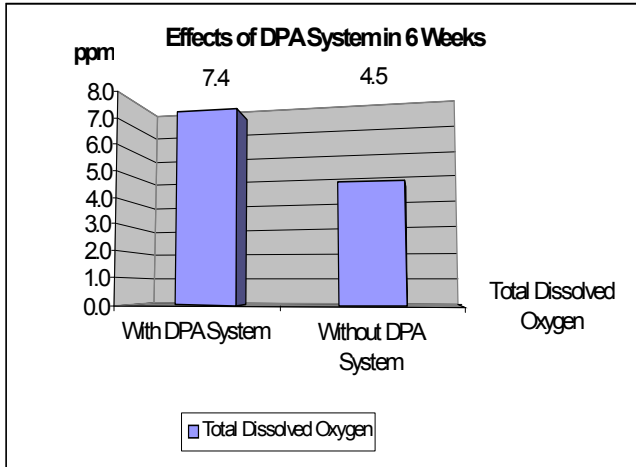
A controlled experiment was carried out jointly with SIF Technologies to demonstrate the positive effects of DPA

system. Beta Splendens, also known as Short Tail Fighting Fish, was used in this trial. Water was circulated within a holding area using DPA system for at least 24 hours before it was recirculated through the system. This gave time for the water to be acclimatized to the surrounding walls of the holding area and maintain ecological stability.

The fingerlings were separated into 2 batches. One batch was placed in DPA treated water and the other in normal (untreated) water. One set of optical recording equipment was used to capture the growth of the fishes. TDO (Total Dissolved Oxygen), TDS (Total Dissolved Solids) and pH (percentage of Hydrogen) were monitored to determine the quality of water.

Results

In water condition without DPA system, Total Dissolved Oxygen (TDO) was 4.5 ppm but with the DPA system, the TDO of water increased to 7.4 ppm. The pH level of the water was stabilized at 6.8. These were observed in a period of 6 weeks

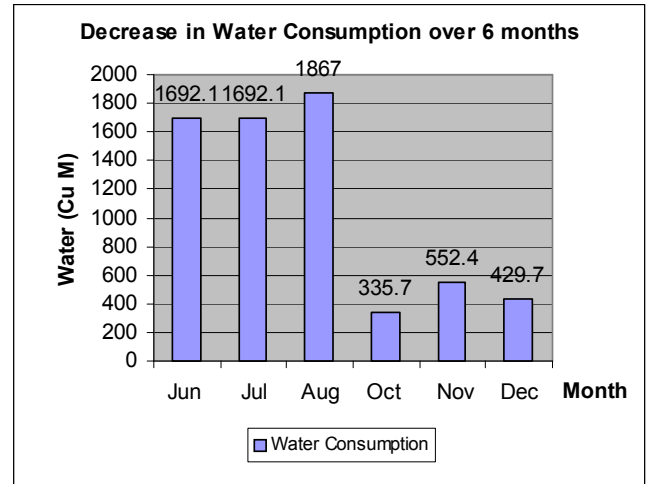


The fishes took a much shorter period to grow up to the same size. The fishes subjected to DPA water took 6 weeks to grow to an average size of 4.5 cm. On the other hand, the fishes in untreated water only grew to an average size of 2.5 cm. It will normally take 3 months for the fishes to grow up to a length of 4 cm and DPA system had accelerated the growth of the fishes.



Fishes in DPA-treated (LHS) water versus fishes in non-DPA-treated water.

The aquarium has seen a huge drop in the usage of PUB water in the farm as they can recycle their water. Previously, the amount of water used by the aquarium usually ranges from 1500 Cu M to 2000 Cu M but within 6 months, the usage of water has dropped to less than 600 Cu M and consistently remained at that level.



**Consumption for November was based on actual reading while the others were based on estimated reading*