SIF TECHNOLOGIES
Water Treatment Solutions

Case Study

Leading Singapore Fish Farm Reduces Mortality Rate by more than 90%

Challenge

A leading fish producer rears a variety of fish such as giant snakeheads, grouper, red tilapia, bullfrog, patin, toman and grass carp. They are the only farm in Singapore to have obtained license from AVA to operate a retail outlet on its own premises. Their major customers include well-known restaurants and hyper-marts in Singapore. However, they encounter inefficiencies in their operations due to fluctuations in water quality.

When contamination of water occurs due to decomposition of fish feed or excretion of fishes, there will be an increase in organic nutrients such as nitrate/ phosphate. If temperature and nutrient levels are optimum, there will be rapid algae growth, leading to "algae bloom." Algae blooms are likely to cause oxygen reduction within fish ponds. Low dissolved oxygen (DO) levels result in higher fish mortality or makes the aquatic environment less conducive for fish growth. Thus, the farm experiences loss of fishes and growth of fishes which are less than desired.

Solutions

Site survey and engineering audit were conducted by SIF Technologies and key problems were identified. Subsequently, on 30th August 2006, a full-scale trial was initiated to optimize the operations of the farm. DPA system was introduced into a pond which measures 30 m x 18 m x 2.5 m and contains approximately 1, 500, 000 litres of water.

Optical recording equipment was used to document the effects of DPA system on the quality of water and growth of fishes. Water analysis was collected consistently on a weekly basis and recorded every Wednesday at 2pm. Results were evaluated by measuring the level of pH, Total Dissolved Oxygen (TDO) and Total Dissolved Solids (TDS).

Results

Before DPA system was installed, measurements showed that the oxygen count of pond water in the farm was 0.98 ppm. One week after the installation of DPA 4000, the oxygen count escalated to 10.84ppm. This would have positive impacts on the water quality and increase the success rate of aquaculture operations.

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QUALITY WATER MANAGEMENT

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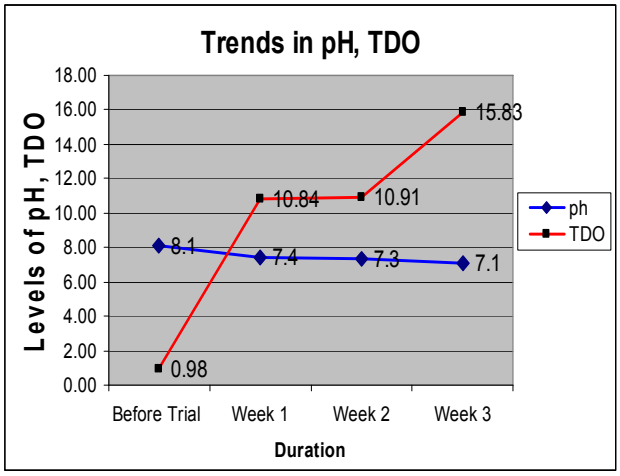

At the end of the first week, mortality rate of the Tilapia fishes decreased. Before subjecting the pond to DPA system water treatment, there used to be 40 – 50 fish mortalities daily. Around 1200 to 1500 fishes would be lost in a single month. After DPA system was introduced, fish mortality rate dropped to only 8 fishes per month, according to testimonials of personnel from the fish farm. This translated to significant cost savings for them.

8 weeks after the trial started, there were noticeable differences in the condition of fishes. The fishes which were subjected to DPA system water treatment displayed richer colours and had larger sizes. (See Figure 1 and 2) There was also a better yield. The average weight of the red tilapias harvested from the pond treated with DPA system was approximately 700g compared to other red tilapias which had average weight of 300 g.

Figure 1: Above - red tilapia bred in a DPASYS treated pond. Below - red tilapia bred in an untreated pond.

Figure 2: Left - red tilapia bred in a DPASYS treated pond. Right - red tilapia bred in an untreated pond.

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