CONSTRUCTION AND ENVIRONMENTAL CONTROL OF A SMALL- SCALE FISH TANK FOR BREEDING AND PRODUCING FRESHWATER FISH

BY

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ABSTRACT

Experiments were carried out throagh two years from 2014 to 2015 at a private farm, Sharkia Governorate, Egypt to study the effect of some different parameters on the performance of two designed aquaculture tanks (round and square) during aquaculture of Nile tilapia (*Oreochromis niloticus*).

The main objective of the present research is to construct and control environment of a small-scale fish tank for breeding and producing freshwater fish.

To achieve the main objective, the sub main objectives of this investigation are to:

1- Evaluate some different parameters (tank shape, fish stocking density, with and without biological filter, and aeration regime) affecting Nile tilapia production.

2- Evaluate the constructed fish tank from the economic point of view.

Two small-scale designed fish tanks (round and square) were constructed for breeding and producing freshwater fish. To control environment, experiments were carried out to study the effect of some different parameters on the performance of the two designed tanks during aquaculture of Nile tilapia (*Oreochromis niloticus*). Performance was experimentally investigated as a function of change in tank shape, fish stocking density, with and without biological filter, and aeration regime in terms of ammonia concentration, dissolved oxygen, biomass, dead fish, body weight gain, specific growth ratio, relative growth ratio and required power.

The experimental results reveal that the highest biomass of (13.53 kg/m^3) while dead fish (3 fish/m^3) was acceptable under the following conditions: use of the round fish tank, use of air compressor with inter-holes distance of 150 mm as an aeration regime and adjust stocking density at 200 fish/m^3.