

พิมพ์ต้นฉบับที่จัดโดยวิทยานิพนธ์ภายในกรอบสี่เหลี่ยมนี้เพียงแผ่นเดียว

## C717904 : : MAJOR ENVIRONMENTAL ENGINEERING

KEY WORD:

WATER QUALITY / *Tilapia nilotica* / RECIRCULATION / INTERMITTENT SAND FILTER

MONWIPHA LUECHAI : WATER QUALITY IMPROVEMENT IN *Tilapia nilotica* PONDS BY INTERMITTENT SAND FILTER SYSTEM. THESIS ADVISOR : ASSO. PROF. MUNSIN TUNTOOLAVEST, Ph.D. 304pp. ISBN 974-637-264-5

The purposes of this study were to monitor the water quality variation in *Tilapia nilotica* ponds treated by intermittent sand filter system at different recirculation rates, and to determine the optimum recirculation rate for maximum efficiency of tilapia culture.

Four ponds with 50 tilapias for each were comparably conducted on closed system. The first pond was operated without any water quality improvement while others had been treated by intermittent sand filters with 5, 10 and 20% water recirculation equalling 21, 42 and 84 liter/day respectively .

From the experimental results, the water temperature varied from 25.6 to 33.4 °C and the average dissolved oxygen at all ponds was more than 5 mg/l which was suitable for cultivation of tilapia and the minimum dissolved oxygen found in the first pond. The greatest amount of accumulated organic substance or waste appeared significantly in the first pond and decreasingly declined from the second pond to the fourth pond. Especially in the fourth pond, the accumulated organic substance was the least. The mean nutrient concentrations in all ponds were as followed : 2.1, 1.4, 0.86 and 0.76 mg/l N for ammonia, 3.2, 2.1, 2.4 and 0.79 mg/l N for nitrite, 13.1, 13.5, 15.5 and 5.4 mg/l N for total nitrogen, and 13.7, 10.5, 9.7 and 0.99 mg/l for total phosphorus. The mean dissolved COD concentrations were not significantly different (87.3, 86.8, 79.0 and 71.4 mg/l consequently). The maximum net production of tilapia was found in pond 3 (4.81 kg/pond) and the net production of tilapia in the pond 4, 2 and 1 were 4.15, 3.62 and 3.01 kg/pond respectively. The highest survival rate, 77.6%, appeared in pond 4 and the rate of 70.5, 63.5 and 53.8% appeared in pond 3, 2 and 1 respectively.

In conclusion, the 20% water recirculation rate was the optimal rate which brought the minimum accumulated organic substance or waste while the 10 and 5% water recirculation gave the lower and lowest efficiency respectively.

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