

Sutee Wongmaneeprateep 2006: The Effect of Sodium Nitrate Base (Nutrilake) on Raising Black Tiger Shrimp (*Penaeus monodon* Fabricius) in a Closed System. Master of Science (Fisheries Science), Major Field: Fisheries Science, Department of Fishery Biology.

Thesis Advisor: Assistant Processor Chalor Limsuwan, Ph.D. 128 pages.

ISBN 974-16-1754-2

The effect of sodium nitrate base (Nutrilake) on raising black tiger shrimp (*Penaeus monodon*) in a closed system was studied. Nutrilake was applied over the moist soil at the rate of 10-40 kg/1,600 m<sup>2</sup> (rai), depending on the percentage of organic matter during pond preparation. The ponds were left for 5-10 days before water was added to the pond and more Nutrilake was added at the rate of 3-5 kg/rai. Then, five days later, postlarvae stage 15 were added at density of 67,200 shrimp/rai (42 shrimp/m<sup>2</sup>). There were three experimental ponds with area of approximately 4,800 m<sup>2</sup> (3 rai) each. More Nutrilake was added at the rate of 2.0-2.5 kg/rai every week until the shrimp were harvested. There were three control ponds, which were prepared in the normal way with no Nutrilake added. The control ponds were the same size as the experimental ponds and shrimp were stocked at the same density. The water salinity during the culture period was 1.2-3.1 ppt. After 125 days the shrimp were harvested. The yield in the experimental ponds was 643±102.0 kg/rai and survival rate was 61.6±12.36 %. In the control ponds the yield and survival rate were lower at 481±124.7 kg/rai and 47.6±14.40 %, but this was not a statistically significant difference.

There was a statistically significant difference in the amount of nitrite. In the ponds to which Nutrilake was added, the nitrite concentration was an average of 0.05±0.061 mg/l, compared with 0.08±0.083 mg/l in the control ponds. The types of plankton found in the experimental ponds and control ponds were similar. The average number of plankton in the experimental ponds was statistically significantly higher than in the control ponds. Also, the redox potential of the soil at the bottom of the experimental ponds was statistically significant higher than in the control ponds. In conclusion, this study demonstrated that adding Nutrilake to ponds used for raising black tiger shrimp in a closed system could help reduce the amount of organic matter. Nutrilake was also an important nutrient for phytoplankton and a source of oxygen for aerobic bacteria in the pond bottom, reducing the redox potential and inhibiting the formation of hydrogen sulfide.

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