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RESEARCH REPORTS

Sustainable Aquaculture for a Secure future

Title: Stocking Densities of Nile Tilapia in Tilapia-Shrimp Polyculture Under Fixed Feeding Regime

Author(s): Yang Yi and Potjaneey Clayden
Aquaculture and Aquatic Resources Management
School of Environment, Resources and Development
Asian Institute of Technology
Pathumthani, Thailand

Kevin Fitzsimmons
Environmental Research Laboratory
University of Arizona
Tucson, Arizona, USA

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Abstract: An experiment was carried out in nine 200-m² earthen ponds at the Asian Institute of Technology, Thailand, to investigate the growth performance of Nile tilapia (*Oreochromis niloticus*) and shrimp (*Penaeus monodon*) and water quality in different stocking combinations of tilapia-shrimp polyculture under fixed feeding regime. There were three treatments in triplicate each: shrimp alone at 30/m² (monoculture, control); shrimp at 30/m² and Nile tilapia at 0.25/m² (low tilapia density polyculture); shrimp at 30/m² and Nile tilapia at 0.50/m² (high tilapia density polyculture). The fixed same feed ration for all ponds was determined by a feeding table during 75-day culture period.

Results showed that the low tilapia density polyculture resulted in significantly higher shrimp yield than the monoculture and high tilapia density polyculture ($P < 0.05$). FCR of 1.44 in the low tilapia density polyculture was significantly better than those (1.73 and 1.69) in both monoculture and high tilapia density polyculture, respectively ($P < 0.05$). Nile tilapia showed fast growth (4.64-4.70 g/fish/day). There was no significant difference in growth and survival of Nile tilapia between the low and high tilapia density polyculture ($P > 0.05$), while fish yields were significantly higher in the high tilapia density polyculture than those in the low tilapia density polyculture ($P < 0.05$).

Partial budget analyses indicated that the low tilapia density polyculture gave the highest net

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return, followed by the high tilapia density polyculture and shrimp monoculture and the ratio of added return to added cost in the low tilapia density polyculture reached 22.69, which is higher than that (5.04) in the high tilapia density polyculture.

The present study indicated that the addition of Nile tilapia into shrimp ponds can improve feed utilization efficiency, resulting in better economic returns and less environmental pollution. The present study showed that the tilapia-shrimp polyculture with appropriate feeding strategy is technically feasible, economically attractive and environmentally friendly.

This abstract is excerpted from the original paper, which was published in Proceedings of the 5th National Symposium on Marine Shrimp, BIOTECH, Thailand, pp. 100-113.