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Sustainable Aquaculture for a Secure Future

Title: Effects on Fertilization and Feeding Strategy on Water Quality, Growth Performance, Nutrient Utilization and Economic Return in Nile Tilapia

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Abstract: The present research was conducted in six 280-m² earthen ponds at Bang Sai, Thailand, to investigate and compare water quality, growth performance, nutrient utilization, and economic return for Nile tilapia culture with two fertilization and feeding strategies. There were two treatments in triplicate each: (A) fertilizing ponds throughout the culture period and feeding Nile tilapia starting from day 80; (B) fertilizing ponds until day 80 and feeding Nile tilapia starting from day 80. Ponds were stocked with sex-reversed all-male Nile tilapia at 3 fish m⁻². The study showed that tilapia growth in treatment A was significantly better than that in treatment B. Final mean weight of tilapia in treatment A was 312±1.8 g and mean daily weight gain was 1.8±0.0 g day⁻¹, whereas in treatments B final mean weight was 248±17.5 g and mean daily weight gain was 1.4±0.2 g day⁻¹. Net tilapia yield in treatments A and B was 16.7±0.4 and 13.0±1.4 t ha⁻¹year⁻¹, respectively. Overall mean concentrations of total alkalinity and total ammonia nitrogen were significantly higher in treatment A than those in treatment B, however, the overall mean values of all other measured water quality parameters were not significantly different between the two treatments. Total inputs of nitrogen and phosphorus through fertilizer and feed over the culture period were significantly higher in treatment A than those in treatment B, however, percentage recovery of N and P in the harvested biomass was higher in treatment B than that in treatment A. Economic analysis showed that tilapia culture practice with fertilization plus feeding (treatment A) generated 50% additional gross revenue as compared to the fertilization followed by feeding (treatment B). Moreover, treatment A showed a positive return, whereas a negative return was observed in treatment B. Apparently, better economic return in treatment A is due to the improved growth performance of Nile tilapia in treatment A than in treatment B, which might have been influenced by the presence of plenty of natural food in the ponds. The results suggest therefore that combination of fertilization and feeding should be a preferred strategy over fertilization followed by feeding for culturing Nile tilapia.

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