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RESEARCH REPORTS

SUSTAINABLE AQUACULTURE FOR A SECURE FUTURE

Title: Recycling pond mud nutrients in integrated lotus–fish culture

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Abstract: An experiment was conducted in nine 200-m² fertilized earthen ponds at the Asian Institute of Technology, Thailand, during January–September 2000. This experiment was designed to assess the recovery of nutrients from pond mud by lotus (*Nelumbo nucifera*), to assess pond mud characteristics after lotus–fish co-culture, and to compare fish growth with and without lotus integration. There were three treatments in triplicate: (A) lotus–tilapia co-culture; (B) tilapia alone; (C) lotus alone. Seedlings (0.39 ± 0.09 kg) of Thai lotus variety were transplanted to ponds of the treatments with lotus (treatments A and C) at a density of 25 seedlings pond⁻¹, while sex-reversed all-male Nile tilapia (*Oreochromis niloticus*) fingerlings (8.6–10.3 g) were stocked at two fish per square meter in ponds of the treatments with tilapia (treatments A and B) when the water depth had been increased to 50 cm due to increasing lotus height. Ponds stocked with tilapia (treatments A and B) were fertilized weekly with urea and triple super phosphate (TSP) at a rate of 4 kg nitrogen (N) and 1 kg phosphorus (P)/ha/day after tilapia stocking. There was no fertilization in ponds of the lotus alone treatment. Lotus co-cultured with tilapia or cultured alone in ponds was able to effectively remove nutrients from old pond mud. Annual nutrient losses from mud in a 1-ha pond was about 2.4 ton N, and 1 ton P, among which about 300 kg N and 43 kg P were incorporated in

lotus biomass. There were no significant differences in lotus growth performance between the lotus-tilapia and lotus alone treatments, while Nile tilapia cultured alone grew significantly better than when co-cultured with lotus. The present experiment has demonstrated the effectiveness of nutrient removal from old pond mud by lotus and the feasibility of rotation and co-culture of lotus and Nile tilapia. Both systems can recycle nutrients effectively within ponds and are environmentally friendly culture systems.

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