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RESEARCH REPORTS

Sustainable Aquaculture for a Secure Future

Title: Polyculture of Sahar (*Tor putitora*) with mixed-sex Nile tilapia

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Abstract: Sahar (*Tor putitora*) is an economically important indigenous fish in Nepal, with major efforts to conserve and propagate the species. It is a predator and may function to control recruitment by naturally produced Nile tilapia (*Oreochromis niloticus*) in ponds. Sahar (*Tor putitora*) were cultured with Nile tilapia (*Oreochromis niloticus*) to evaluate control of tilapia recruitment in aquaculture ponds. Two experiments were conducted to assess the effects of the sahar to tilapia stocking ratio on the recruitment and growth of mixed-sex Nile tilapia. The first experiment was conducted in 100 m² earthen ponds at the Institute of Agriculture and Animal Science, Chitwan, Nepal to determine these effects. The second experiment was conducted on farm at Kathar, Chitwan, Nepal to verify the results in working ponds. The on-station experiment had four treatments with three replicates each: tilapia monoculture (T1), 1:16 sahar to tilapia ratio (T2), 1:8 sahar to tilapia ratio (T3), and 1:4 sahar to tilapia ratio (T4). Tilapia were stocked at 2 fish m⁻² (average size 11.3 g), and sahar were stocked at treatment densities (15.2 g average size) in each pond. The ponds were fertilized weekly using diammonium phosphate (DAP) and urea at the rate of 0.1 g P m⁻² d⁻¹ and 0.4 g N m⁻² d⁻¹ respectively. Tilapia were fed with a locally made pelleted feed (27% crude protein), at the rate of 2% body weight every other day after attaining a size of 100 g. Results showed significantly increased average harvest size ($P < 0.05$) for treatment 2, when sahar were stocked with tilapia compared to the tilapia monoculture. The number of recruits significantly

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decreased ($P > 0.05$) when sahar were stocked, and recruit numbers were inversely proportional to stocking density of sahar. Stocking of sahar reduced tilapia recruitment in a mixed-sex Nile tilapia pond culture system and produced better tilapia growth and production. Stocking at a 1:16 sahar to tilapia ratio gave the best overall performance.

The on-farm experiment was composed of three treatments with three replicates each: tilapia monoculture (T1), 1:33 sahar to tilapia ratio (T2), and 1:16 sahar to tilapia ratio (T3). Ponds were fertilized every two weeks with DAP and urea at the same rate as on-station experiment, but there was no feeding. On-farm results showed significantly higher tilapia growth with a 1:33 stocking ratio of sahar to tilapia compared to tilapia monoculture. As with the on-station experiment, the number of recruits decreased with increasing stocking density of sahar. Lower sahar stocking provided higher growth and production of stocked tilapia, though there were fewer recruits at these levels. There might have some growth depression of tilapia at higher sahar stocking densities. Stocking sahar to Nile tilapia at 1:33 showed better overall performance than monoculture but not the 1:16 treatment in terms of Nile tilapia growth, production, growth of sahar and gross income.

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