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RESEARCH REPORTS

Sustainable Aquaculture for a Secure Future

Title: Strategies for stocking Nile tilapia (*Oreochromis niloticus*) in fertilized ponds

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Abstract: In a 149-day grow-out experiment, we tested the effects of stocking density, partial harvesting and intermediate stocking on net fish yield (NFY) and harvest size of Nile tilapia (*Oreochromis niloticus*). Sex reversed male tilapia were raised in 280-m^2 earthen ponds, which received 8 kg dry weight chicken manure $\cdot ha^{-1} \cdot day^{-1}$ with urea and triple superphosphate supplement to give a total fertilization rate of 4.0 kg $N \cdot ha^{-1} \cdot day^{-1}$ and 1.0 kg $P \cdot ha^{-1} \cdot day^{-1}$. The five treatments were three stocking densities of 0.8, 1.6, and 2.4 fish $\cdot m^{-2}$, fish stocked at 0.8 fish $\cdot m^{-2}$ with an additional 0.8 fish $\cdot m^{-2}$ added after 2.5 months, and fish stocked at 1.6 fish $\cdot m^{-2}$ with 50% of fish removed after 2.5 months.

Stocking density significantly affected fish yield (r^2-0.57**,** $P<0.02$); extrapolated mean NFY in ponds stocked at 0.8, 1.6 and 2.4 fish $\cdot m^{-2}$ were 14.2, 19.2 and 25.7 kg$\cdot ha^{-1} \cdot day^{-1}$, respectively; mean weights were 335, 230 and 214 g $\cdot fish^{-1}$, respectively. Mean NFY for the first 2.5 months exceeded 39.0 kg$\cdot ha^{-1} \cdot day^{-1}$ in ponds stocked at 2.4 fish $\cdot m^{-2}$. Partial stocking gave slightly higher total NFYs than partial harvesting, or 21.7 kg$\cdot ha^{-1} \cdot day^{-1}$ compared to 18.0 kg$\cdot ha^{-1} \cdot day^{-1}$. Additional stocking did not significantly affect fish growth of the originally stocked fish. Mean harvest weights of fish stocked at 0.8 fish $\cdot m^{-2}$ were similar to the first stocked fish in the treatment receiving an additional 0.8 fish $\cdot m^{-2}$ after 2.5 months. Results suggest a partial intermediate stocking and partial harvesting strategy may produce annual tilapia yields of 30 kg$\cdot ha^{-1} \cdot day^{-1}$, with mean weights over 300 g $\cdot fish^{-1}$.

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Implications for managing ponds for higher yields at desired mean fish weights are discussed.

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