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AQUACULTURE & FISHERIES INNOVATION LAB

## RESEARCH REPORTS

Sustainable Aquaculture for a Secure Future

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**Title:** Optimization of Phosphorus Fertilizer in Supplemental Feed-Fed Based Nile Tilapia (*Oreochromis niloticus*) Ponds

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**Abstract:** An experiment was conducted in earthen ponds at the Asian Institute of Technology, Thailand to determine different phosphorus fertilizer dose effects on Nile tilapia production, water quality variables, nutrient utilization and cost-benefit under supplemental feeding. Five phosphorus fertilization rates were used as treatments e.g. 100%, 75%, 50%, 25% and 0% of 7 kg P ha week<sup>-1</sup>. Nitrogen fertilization rate was fixed at 28 kg N ha week<sup>-1</sup> for all the treatments. Sex-reversed Nile tilapia were stocked at 3 fish m<sup>-2</sup>, and 30% CP floating feed fed at 50% satiation feeding rate. Nutrient budget showed higher phosphorus fertilizer input resulted in higher phosphorus sink in the sediment. Mean weight, mean weight gain, daily weight gain and net yield were not significantly different among treatments ( $P > 0.05$ ). Total Kjeldahl nitrogen, total phosphorus and soluble reactive phosphorus were significantly different among treatments. Economic analysis showed phosphorus fertilization resulted in positive net returns. Though the gross income was not affected by different fertilization rates, significantly lowest cost was found in the treatment using 25% phosphorus fertilizer. It can be concluded from the research that 25% phosphorus fertilization might be used as an alternative strategy of Nile tilapia pond culture in terms of economic return and nutrient loss in sediment.

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