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RESEARCH REPORTS

Sustainable Aquaculture for a Secure Future

Title: The effects of water depth and circulation on the water quality and production of *Penaeus monodon* in earthen ponds

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Abstract: Successful high intensive shrimp grow-out schemes typically use deep ponds (1-2 m) together with aeration/circulation. Little is known, however, why deep ponds are more productive than shallow ponds. It is important to understand the water quality and production dynamics of ponds of different depths to develop appropriate shrimp culture methods. The effects of water depth and circulation on the production of the giant tiger shrimp, *Penaeus monodon,* in 0.1-ha earthen ponds were tested in a 3 x 2 factorial experiment, with three depth treatments (0.5, 1.0 and 1.5 m) and two circulation regimes (daytime circulation and uncirculated). Stocking density was 4 postlarvae/m^2. Production and survival were determined after five- and four-month culture periods during the dry and wet seasons, respectively, in 1985. Water circulation positively influenced primary productivity, decreased the surface temperature, and reduced stratification of temperature and dissolved oxygen. Water depth significantly affected almost all water quality parameters, the deeper ponds producing shrimp of significantly larger size. However, there were no treatment effects on shrimp production due to an inverse relation of survival and average size. It can be said that water depth and circulation profoundly affect the water quality of brackishwater shrimp ponds, but that the effects on shrimp production are not apparent at the stocking density used in this experiment. Further tests at higher stocking

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densities are necessary to establish the causal relationships of water depth, survival and average size of shrimp.

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