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Sustainable Aquaculture for a Secure Future

Title: Water quality dynamics in brackishwater shrimp ponds with artificial aeration and circulation

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Abstract: Water aeration and circulation using paddlewheel aerator and motor-driven propeller blades, respectively, were maintained under four different diurnal regimes to test their effects on water quality and production of *Penaeus monodon*. Shrimp with an average weight of 0.03 gm were stocked at a density of 33 individuals/m^2in four 0.05-ha earthen ponds. The four treatments were: (1) continuous aeration (2) nighttime aeration (3) nighttime aeration and daytime circulation and (4) no aeration or circulation. Ammonia nitrogen (NH_3-N), dissolved oxygen, temperature and shrimp growth were monitored during a culture period of 10 weeks. Ammonia nitrogen concentration did not differ significantly under the various aeration and circulation treatments. Dissolved oxygen and temperature stratification was least evident in treatments 1 and 3. Nighttime dissolved oxygen levels were significantly lower in treatments 1 and 4. The average size of shrimp at harvest was significantly higher in treatments 1 and 3. These findings taken together indicated that there was no clear benefit from continuous aeration. Rather, a combination of nighttime

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aeration, when needed, and daytime circulation could result in the greatest water quality benefits with the least energy consumption.

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