

Mathud Benjaprasertsri 2007: Application Study of Paddle-Wheel Aerators Using Motors and Engines in Intensive Pacific White Shrimp (*Litopenaeus vannamei*) Culture Ponds. Master of Science (Aquaculture), Major Field: Aquaculture, Department of Aquaculture. Thesis Advisor: Assistant Professor Wara Taparhudee, Ph.D. 64 pages.

Application study of paddle-wheel aerators using motors and engines was conducted in intensive Pacific white shrimp (*Litopenaeus vannamei*) culture ponds. The purpose of the study was to compare water velocity, water quality, soil quality, production and energy cost of two paddle-wheel aerator systems, operated by motors and engines, commonly used in shrimp farms. The study was separated into two experiments. The first experiment focused on water velocities produced by paddle wheel aerators using different rotational speeds. Research found that water velocity could not be measured at a distance of 25 meters away from the front of both types of aerators at all the different speeds. The second experiment involved six 3 rai ponds at intensive Pacific white shrimp farm. Three ponds were aerated using six long-armed paddle wheel aerators, powered by two, 11 hp diesel engines. The other three were aerated by six long-armed paddle wheel aerators and used four, 2 hp electric motors. Each paddle-wheel aerator was installed 25 meters apart. Shrimp larvae were stocked at a density of 100,000 pl/rai in each pond. The results showed that the ponds operating paddle wheel aerators using engines had average an operating cost of $86,946.88 \pm 313.87$ Bath/rai, which was higher than the ponds using motors at $81,349.22 \pm 289.64$ Bath/rai. However, the first type obtained greater average production and higher average profit at $1,121.66 \pm 4.04$ kg/rai and $42,044.78 \pm 803.78$ Baht/rai respectively, compared to the second type at $1,036.33 \pm 3.21$ kg/rai and $34,720.11 \pm 74.79$ Baht/rai respectively. This was because the paddle wheel aerators using engines could produce greater water velocity than the motors type. Consequently they provided more dissolved oxygen to the water, cleaner feeding area, and moved the waste and sediment to the center of the pond more efficiently, which are important factors for the success of shrimp culture.

Mathud Benjaprasertsri

Student's signature

W. Tap.

Thesis Advisor's signature

27 / 3 / 50