

Thesis Title	Possible Cultivation Method for Increasing Blood Cockle (<i>Anadara nodifera</i>) Production in Traditional Aquaculture Pond, Bangkhunthian District
Thesis Credit	12
Candidate	Ms. Wilawan Seekaew
Thesis Advisor	Assoc. Prof. Boosya Bunnag
Co-Advisor	Asst. Prof. Dr. Monthon Ganmanee
Program	Master of Science
Field of Study	Natural Resource Management
Department	Natural Resource Management
Faculty	School of Bioresources and Technology
Academic Year	2013

Abstract

This study aimed to determine the effect of size and density of blood cockle on specific growth rate, under natural condition of traditional aquaculture pond and to analyze costs and benefits for the investment in blood cockle culture. Result from this study showed that the concentrations of total suspended solids during spring tide was 0.17 mg/l and neap tide was 0.15 mg/l. Sedimentation rate was found to vary depending on the particle size of suspended solid which varied during spring tide and neap tide. Water and sediment quality was suitable for marine aquaculture. Analyses of nitrogen budget of pond showed potential to produce organic nitrogen in term of phytoplankton. The study of clearance rate in cockle found the relationship between food concentration and clearance rate which can be expressed as $y = 0.0121 x^{-1.3556}$, where y is the clearance rate and x is food concentration. In addition, at the same food concentration, negative relationship between clearance rate and soft-body tissue dried weight was found. Clearance rate decreased when soft-body tissue dried weight was increased. Thus, the density of cockles reared in the pond could be calculated from the concentration of suspended solids and clearance rate. The results calculated were that the density of 96 individual/m² was suitable during spring tide and 167 individual/m² during neap tide. The experiment was furthered done by culturing cockles in natural pond at 4 density levels: 25, 50, 100, and 150 individual/m². The initial size of was 1 - 2 cm in length (330 individual/kg) and 2 - 3 cm (165 individual/kg). The specific growth rate of cockle in both sizes was found to be different ($P < 0.05$) but no difference ($P > 0.05$) was detected for the 4 levels of density of the same size. However, in this study, the experimental units are small when compared to the amount of food and water volume in the pond thus food concentration was not limited and not inhibited growth rate in all 4 levels of density. The study of the costs and benefits showed three structures of cockles cultivation in Bangkhunthian. Variable costs of the three structures in term of cash were cockle seeds and in term of non-cash was the opportunity cost of family labor. A fixed cost was associated with land. The results of this study could be summarized that the possibility of increasing or improving cockle production in traditional aquaculture pond as follows: 1) Size selection of seeds, the selection of a small seed that has lower cost than the large seed (about 4-8 times) but large seed requires shorter time to rearing thus has less risk from environmental effect. 2) To determine the density, farmers should take into account the concentration of suspended solids in pond and clearance rate of cockles, in order to provide a sufficient of cockles at rear.

Keyword: Increasing Production / Cockle / Bangkhunthian District / Traditional Pond / Costs and Benefits