Effect of Better Management Practices (BMPs) on the production and occurrence of out breaks of white spot syndrome in tiger shrimp, ***Penaeus monodon***, in grow out ponds

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Abstract

Better management practices (BMPs) are considered as most effective methods of reducing environmental impacts of shrimp farming and effect of diseases on shrimp while being compatible with resource management goals. White Spot Syndrome has been a killer disease in cultured shrimp which has caused total failure in many grow-out ponds in Sri Lanka since it was first recorded in 1996. Therefore, better management practices have been proposed for hatcheries, grow-out farms, brood stock collection, feed imports, chemical imports and use of chemicals in shrimp industry. From 2005, BMPs for grow-out ponds were implemented in some shrimp farms in Sri Lanka. The present study was planned to investigate whether the occurrence of white spot syndrome could be prevented or whether effect of the disease could be reduced by implementing the proposed BMPs in grow-out ponds allowing the farmers to achieve an economically profitable production (harvest).

Ten better management practices were identified, categorized considering their possible contribution in preventing /reducing the effect of, white spot syndrome and a score was allocated for each BMP. Two hundred shrimp grow-out ponds were randomly selected and using a questionnaire BMPs practiced in each pond were obtained, a score was given to each BMP and then a total BMP score for a pond was estimated. Occurrence of outbreaks of white spot syndrome in each pond over the production cycle was recorded and a severity index was given considering the time of occurrence and mortality of shrimp. Production data and other profit related information were collected for each pond.

There was a significant positive linear relationship between the shrimp production and the total BMP score received by the ponds ($P<0.01$, $r = 0.6042$) indicating that when better management practices are carried out at a higher level, a better production could be obtained. There were significant positive linear relationships between the total BMP score received by the ponds and growth rate of shrimp, mean body weight of shrimp at harvest and percentage survival that contribute for a greater profit. Negative linear significant relationship existed between total BMP score and food conversion ratio (FCR) which could reduce production cost of the farmer. There was no significant relationship between cost of implementation of BMP per kilo gram of harvest and the total BMP score received by the pond.

Outbreaks of white spot syndrome were recorded in almost 50% of ponds used for the present study during the production cycle studied. However, farmers that have implemented BMPs in their ponds at a higher level could complete a greater length of the production cycle resulting in higher average body weight at harvest and higher survival. White spot syndrome severity index negatively correlated to the total BMP score achieved by the ponds ($P<0.01$, $r=0.4948$) indicating that severity of the disease was reduced in ponds where BMPs were implemented at a higher level. Present study show that implementation of better management practices proposed for Sri Lankan shrimp grow-out ponds could reduce the effect of outbreaks of white spot syndrome on the shrimp production (harvest).