

Stocking and Management of Shrimp Seeds in Shrimp Farming of Nagapattinam and Mayiladuthurai Districts

Lloyd Chrispin C^{1*}, Aruna S², Omprakash P³ and Ilangamani P⁴

¹ Assistant Professor, Department of Fisheries Extension, Economics and Statistics,
Dr. M.G.R Fisheries College and Research Institute, Ponneri.

² Assistant Professor, Department of Aquatic Environment Management,
Dr. M.G.R Fisheries College and Research Institute, Ponneri.

³ Enumerator cum Data Entry Operator, Department of Fisheries Extension, Economics and Statistics,
Dr. M.G.R Fisheries College and Research Institute, Ponneri.

⁴ PG Scholar, Department of Fisheries Extension, Economics and Statistics,
Dr. M.G.R Fisheries College and Research Institute, Ponneri.

Corresponding Author

Lloyd Chrispin C

Email: Lloyd@tnfu.ac.in



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ABSTRACT

Shrimp farming success depends on efficient stocking methods and careful early-stage management. Farmers adopt diverse stocking systems, including nursery ponds, rearing ponds and biofloc tanks, tailored to their operational scale. The first 20 days are pivotal, with practices like optimized feeding schedules, aeration and continuous monitoring ensuring seed survival and growth. These strategies minimize mortality and disease risks, creating a strong foundation for sustainable and profitable shrimp farming. This article explores the stocking practices and the management of shrimp seeds followed in Nagapattinam and Mayiladuthurai districts.

INTRODUCTION

Maximizing pond yield largely depends on effective stocking practices and subsequent operational management. Stocking of shrimp seeds is a critical operational task, where determining the ideal stocking density is essential. Stocking density is influenced by various factors such as size of the seed, natural mortality rates, pond productivity and the chosen culture systems. The first 20 days play a pivotal role in determining the survival, growth and overall yield of the shrimp. This period requires careful attention to water quality, feed management and health monitoring to ensure that the seeds adapt well to the environment and achieve optimal growth.

Stocking of shrimp seeds

After selecting shrimp seeds from the hatchery, they are packed and transported to the shrimp farm at a controlled temperature of 20-25°C, where the stocking of seeds is carried out. Stocking is the process of introducing shrimp seed into a rearing environment, marking the start of the culture cycle. The stocking process varies based on individual farm facilities, with methods including stocking in nursery ponds, directly in rearing ponds or biofloc tanks. These stocking methods are commonly employed in both Nagapattinam and Mayiladuthurai districts.

Stocking methods

Nursery ponds - Stocking in nursery ponds is a common practice in high-density aquaculture systems and farms with multiple ponds. To ensure high survival and adequate feeding of seed during the first 2-3 weeks, shrimp farmers stock the Post Larvae (PL) in a separate nursing pond, usually 5-10 % of the total farm area (*Coastal Aquaculture Authority*). In Nagapattinam and Mayiladuthurai districts, nearly one million shrimp seeds are stocked in

0.5-acre area of nursery ponds by shrimp farmers. During the initial days of culture, these cost-effectively stocked nursery ponds require only fewer resources especially less feed and labour requirements. Thus, these ponds provide a positive start to a profitable shrimp culture. In addition, Maintenance is easier compared to rearing ponds and the controlled environment lowers mortality risks significantly. It also helps to minimize the spread of infections due to reduced feed and probiotic usage. However, they also possess challenges, such as the 24-hour electricity availability and continuous monitoring to ensure optimal conditions for shrimp seed development.



Fig.1. Nursery pond setup in shrimp farm of Nagapattinam region

Directly in the rearing ponds - Small to medium-scale farmers from both Nagapattinam and Mayiladuthurai districts use this method of stocking. In this method, seeds are stocked directly in rearing ponds without stocking in nursery ponds. This stocking is typically done at late night or early morning (around 3 AM) to minimize thermal stress and mortality. Aeration of pond water is done before two hours before the stocking to enhance water circulation, which helps the shrimp seeds to disperse evenly across the pond rather than settling in one place. Seeds are acclimatized to pond water temperature by allowing them to float in packed bags before the release. Interestingly, Superstition and traditional beliefs often influence the stocking

process, as many shrimp farmers choose specific corners (Sani moolai - Vastu principles) of the pond for stocking based on astrological factors. In both Nagapattinam and Mayiladuthurai districts, the stocking density for the rearing pond is about 60 to 70 seeds per sq.ft. Some farmers upon receiving seeds from the hatchery temporarily hold them in small containers or barrels filled with water. They use an electric motor to blow air into the containers to ensure proper aeration. After keeping the seeds in these conditions for two to three hours, transfer to rearing ponds takes place.



Fig.2. Stocking of seeds directly in the pond

Biofloc tanks – Biofloc tanks are a less commonly used method of stocking among farmers in Nagapattinam and Mayiladuthurai districts. When nursery ponds are unavailable, Biofloc tanks are often used as an alternative. This setup demand daily removal of waste to prevent ammonia buildup, ensuring a healthy environment for the shrimp. However, they require higher levels of maintenance and skilled labour to effectively manage the biofloc setup and maintain the optimal water quality.



Fig.3. Biofloc tanks used in shrimp farming of Nagapattinam region

Post – stocking activities

Shrimp farming requires meticulous planning and execution for the first 20 days of seed stocking to ensure proper growth. These activities include feeding, aeration and monitoring and it varies across the farms based on their operational scale and regional traditions. From the first day of stocking, essential tasks such as feeding and aeration operations begin. The first 24 hours are so crucial as it requires intensive monitoring, especially in nursery ponds, as the seeds have to adjust to their new environment. However, rearing ponds typically do not need such intensive monitoring due to different operational requirements.

Feeding practices

In medium and small shrimp farms, such as those in Vedaranyam Taluk, Nagapattinam district, feed is provided only in the evening on the first day and subsequently twice daily (morning and evening) from the second to fifth day to minimize the wastage. In large shrimp farms, feeding is more intensive starting with four times feeding on the first day to cater to the higher seed population. Shrimp feed is categorized by number (Feed No. 1 to Feed No. 5) based on particle size and nutrient composition. Feed No. 1 is primarily used during the first 10 days, as it consists of fine particles that meet the dietary needs of the shrimps. Protein-rich feed is essential, aiming for a weight gain of 3 grams within the first 20 days. During the first five days, feed is distributed from the bund in fine particle form, mixed with a small amount of water for even dispersion. From sixth day onwards, feed is distributed by pond floats, targeting center areas of the pond. The initial feeding rate begins at 2kg feed/one lakh seeds, increasing daily by 200 grams.

Feed trays are used in assessing shrimp appetite and optimizing feed usage. They are

introduced in the pond between 10 to 15 days to monitor feed consumption. 2 – 3 grams of feed per kg of seed are placed in the trays. Trays are checked after three hours to observe the feeding response – no leftover feed indicates the need to increase quantity, while excess feed suggests a reduction. Feeding is done four times daily for the first 20 days, at an interval of 6-7 AM, 10-11 AM, 1-2 PM and 6-7 PM. After 20 days, the feeding frequency will be reduced to align with shrimp's growth stages and nutritional requirements. Probiotics or minerals are not added to the pond water in the first 10 – 15 days to avoid causing harm to the seeds. Instead, they are incorporated into the pond water prior to the stocking of seeds.



Fig.4. Assessing feed tray to check feed intake in pond

Aerator operation and monitoring

Aerators play a pivotal role in maintaining optimal oxygen levels in ponds, which is essential for survival of shrimp seeds (Vijayan *et al.*, 2016). Their operations vary based on farm type and electricity availability. Generally, in Nagapattinam and Mayiladuthurai districts aerators run continuously from 9 PM to 6 AM on the first day of seed stocking. In Vedaranyam and

Nagapattinam taluks, small and medium - scale shrimp farms, constrained by limited resources, operate aerators for shorter durations (3 AM to 6 AM). To reduce the operation cost of aerators, some farms often skip aerator usage during the first 20 days of seed stocking. Continuous observation of feeding behaviour, aeration and pond conditions helps to prevent losses from disease or poor growth performance.

CONCLUSION

In Nagapattinam and Mayiladuthurai districts, the success of shrimp farming during the first 20 days depends on a combination of effective stocking practices, accurate feeding strategies and efficient aeration. It is crucial for ensuring survival, reducing disease risks and attaining optimal growth. While nursery ponds and rearing ponds are the predominant systems, biofloc tanks serve as viable alternative. These collective practices not only enhance the survival and health of Shrimp but also lay a strong foundation for achieving high yields and profitability in the shrimp farming operations of these districts.

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