

Mid-Culture Management strategies followed by Nagapattinam and Mayiladuthurai Shrimp farmers

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Abstract

The intermediate stage in shrimp farming represents a pivotal period that directly impacts the yield and profitability of operations. This phase requires stringent management of water quality, feeding practices, and disease prevention to address challenges like pH fluctuations, ammonia buildup and disease outbreaks. Farmers employ advanced aeration techniques, mineral supplementation, and feed optimization strategies to ensure growth and minimize stress. Partial harvesting is often adopted as a risk mitigation strategy against unpredictable disease outbreaks and market fluctuations. This article highlights the mid – culture management strategies followed in shrimp farms of Nagapattinam and Mayiladuthurai districts.

Keywords: Disease, Feed, Mayiladuthurai, Nagapattinam

Introduction

The intermediate growth stage, spanning of 20 to 50 days in shrimp culture is the most critical phase in shrimp farming where the focus shifts from survival to achieving steady growth and health optimization. During this period, shrimp shows significant development, requires precise feed strategies, water quality management and aeration practices to meet their evolving nutritional and environmental needs. Shrimp farmers of Nagapattinam and Mayiladuthurai districts leverage a combination of tradition knowledge and modern techniques to enhance growth rates, minimize stress and prevent diseases. This period highly influences the overall yield and profitability of shrimp farming operations.

Intermediate growth stage

In shrimp farming, the intermediate growth stage i.e. 20 to 50 days from the start of the culture marks a crucial phase in the growth process of shrimp. In Nagapattinam and Mayiladuthurai districts, earlier farming methods considered the first 50 days to be relatively stable, current practices have revealed that this phase is troubled with challenges primarily due to disease outbreaks and environmental factors. The critical components of this phase which has to be ensured are:

1. Water quality management
2. Feed management
3. Disease management

Water quality management

Water quality is pivotal for shrimp survival and growth during this stage. Water testing should be done to monitor the parameters. Testing begins after 20 days to monitor the parameters like pH, ammonia and minerals.

- **pH monitoring:** Ideal pH values range between 7.5 and 8.0 in the morning and 7.9 to 8.5 in the evening. However, higher pH levels are common during summer in Nagapattinam and Mayiladuthurai districts. pH should be checked before 7 AM in the morning and after 6 PM in the evening. To control elevated pH, molasses or sugar solutions are applied at a rate of 50 litres per acre.
- **Ammonia control:** Ammonia, a byproduct of overfeeding and accumulation of waste at the pond bottom is tested twice a week. Ammonia – controlling drugs are used to prevent toxicity.
- **Mineral Supplementation:** Shrimp require higher mineral intake during the intermediate growth stage. Mineral supplementation is done to sustain growth and health. Once a week, mineral mixture is applied at a rate of 20-30 kg per acre.
- **Aeration management:** Oxygen levels are vital factor, especially in overstocked shrimp ponds. Aerators run continuously from 7 PM to 6.30 AM to prevent oxygen depletion, which could lead to mass mortality.



Fig.1. Red potash used in shrimp farming of Nagapattinam region to enhance minerals

Feed management

During the intermediate growth stage, shrimp have high nutritional requirements. Feed is provided four times daily at regular intervals of 3 – 4 hours with fixed timings. The feed is supplemented with Vitamin C and protein to promote growth and improve health. Over this

period, a total of 2 to 5 tons of feed will be provided. To monitor feeding efficiency, four checks trays are placed on four sides of the pond. The Feed Conversion Ratio (FCR) is maintained at 1:1 to ensure efficient feed usage and minimize costs.



Fig.2. Mixing of feeds, probiotics in shrimp farm

Feed Percentage	Body Weight	Feed Percentage	Body Weight
10gms	5.5%	25gms	1.5%
20gms	5.0%	27gms	1.5%
30gms	4.7%	29gms	1.45%
40gms	4.5%	30gms	1.45%
50gms	4.25%	32gms	1.4%
60gms	4.00%	34gms	1.35%
70gms	3.75%	35gms	1.35%
80gms	3.5%	37gms	1.3%
90gms	3.25%	39gms	1.25%
100gms	3.00%	40gms	1.25%
110gms	2.9%	41gms	1.25%
120gms	2.8%	42gms	1.2%
130gms	2.7%	43gms	1.2%
140gms	2.6%	44gms	1.15%
150gms	2.5%	45gms	1.15%
160gms	2.4%	46gms	1.1%
170gms	2.3%	47gms	1.1%
180gms	2.2%	48gms	1.1%
190gms	2.1%	49gms	1.05%
200gms	2.0%	50gms	1.05%
210gms	1.9%	51gms	1.0%
220gms	1.8%	52gms	1.0%
230gms	1.7%	53gms	1.0%
240gms	1.6%	54gms	1.0%
250gms	1.5%	55gms	1.0%

Fig.3. Feed percentage chart used in shrimp farming

Disease Management

Shrimps are highly vulnerable to diseases during the intermediate growth stage. In Nagapattinam and Mayiladuthurai districts, diseases such as White Spot Disease, Red Tail Disease and Enterocytozoon hepatopenaei (EHP) are particularly prevalent. Over the past three years, the incidence of these diseases has significantly increased, especially in Vedaranyam taluk of Nagapattinam district. In such affected farms, shrimp farming does not go beyond 30 days. Particularly, Red Tail Disease has become a persistent threat causing severe losses within a short period. Shrimp ponds are affected within a week, leaving shrimps weighing only 3-4 grams by 30 days. This lessens the potential for profitable harvesting and often leads to early or partial harvests to recover investments.

Sampling

Sampling is conducted to assess the shrimp's growth and health, usually between 40-50 days. Sampling is done in the early morning or late evening to avoid stress caused by high temperatures. Cast net is commonly used in sampling to catch shrimps. Nets should be disinfected with Potassium Permanganate (KMnO₄) before use. Nets should be cleaned and dried thoroughly between uses in different ponds to prevent cross-contamination.



Fig.4. Cast net used in shrimp farming for sampling of shrimps



Fig.5. Sampling of shrimps is done after 45 days of culture in Nagapattinam region

Partial Harvesting

Intermediate growth stage often determines whether the farmers should continue their farming or should opt for partial harvesting. In Nagapattinam and Mayiladuthurai districts, Shrimp farmers face challenges such as diseases and fluctuating market prices, prompting them to adopt partial harvesting. Typically, about 60% of the shrimp is harvested and sold after 50 days, enabling farmers to recover their initial investments while leaving the remaining stock to grow for the next 25-40 days. This approach helps farmers to balance the need for immediate returns with the potential for higher profits from the remaining stock.

Conclusion

The intermediate growth stage (20-50 days) is critical due to the high risks of disease, water quality issues, and feed management challenges. In the shrimp farms of Nagapattinam and Mayiladuthurai districts, effective management of water quality, feeding practices, and disease prevention plays a key role in mitigating risks and ensuring the health and growth of shrimp. Properly managing this stage is essential for the long-term success of shrimp farming operations in the region and mitigates financial risks.

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