ICAR-CIBA Technologies/18



ICAR-CIBA - a nodal R&D agency working in brackishwater aquaculture for the past three decades with a vision of environmentally sustainable, economically viable and socially acceptable aquaculture technologies, system interventions, technology backstopping and policy inputs by the institute, contributing to economic benefits of the sector which has already recorded annual revenue of ' 30,000 crores.

BIOFLOC BASED SHRIMP NURSERY TECHNOLOGY

Shrimp aquaculture is the economic face of Indian aquaculture and one of the fastest growing food producing sectors. Indian shrimp industry had a phenomenal growth with the introduction of exotic species Penaeus vannamei, reaching 5.66 lakh tonnes of production in 2017-18 and accounting for 41 % of the quantity and 68 % in value (Rs. 30,880 crores) of total sea food exports (MPEDA, 2018). ICAR-Central Institute of Brackishwater Aquaculture, Chennai has been conducting Frontline Demonstrations on Biofloc based Nursery rearing Technology for Pacific white shrimp Penaeus vannamei in different parts of the country with support from the Department of Biotechnology, Govt. of India. this innovative eco-based technology helps in sustainable production through the conversion of waste to microbial floc as natural food within the culture system, ensuring sustainable income. Nursery system has several advantages such as optimization of farm land, increase in survival, enhanced growth performance, protective response of shrimp, uniformity of size and reduction in the farm grow-out period, and reduction of cannibalism. CIBA has developed BFT and demonstrated the technology in the field with SOP (Standard Operating Procedure).



The Technology

- This technology ensures good survival of 90 to 98 % and juveniles reaching a size of 300 to 600 mg when stocked at a density of 3000 to 8000 PLs/m 3.
- Nursery rearing phase extends for 3-4 weeks and can reduce the culture period in the grow-out phase by 20-30 days. It improves productivity, natural food, FCR, economic gain; and reduced costs (15-20% lower cost of production).
- The farmer trainees and other stakeholders who came for exposure visit witnessed the system and pond stocking of the nursery reared juveniles.

Advantages of Nursery rearing technology

- Optimization of farm facilities provided by the high stocking densities in nursery phase to achieve more profitability.
- Diurnal changes (pH, O2, CO2) during nursery is reduced to give better performance.
- Better nutrition by continuous consumption of high nutritious feed under autotrophic or in heterotrophic system
- Better grow-out performance as compensatory growth phenomenon proved.
- Immunity stimulates under these systems thus giving healthy animals.
- It improves productivity, natural food, FCR, economic gain; and reduced costs (15-20% lower cost of production).
- Heterotrophic bacteria can reduce toxic metabolites (NH3-N, NO2-N) in the nursery.
- Easier management and eco-friendly approach (reduced protein requirement, fish meal usage and water/ nutrient discharge).
- Increased protein utilization as the proteins utilized twice, Enhance digestion (with enzymes and growth promoters).
- More diverse aerobic gut flora reducing pathogenic bacteria (Vibrios) with probiotic intervention.

SOP for nursery rearing

SOP for nursery includes nursery design and construction, bio-security, suitable species, stocking (SD depending on system), culture management practices, feed management and carbon addition strategies, water quality management (zero/minimal water exchange), sludge removal etc.,

Effective management of BFT based culture

- 1. Proper Pond/system management (crop holidays-sediment removal-ploughing-drying)
- 2. Proper maintenance of autotrophic/heterotrophic organism
- 3. Healthy PL Free from diseases (WSSV, EHP, IHHNV AHPND etc.)
- 4. Water activation or maturation and microbiota balance
- 5. Waste management through sludge removal/syphoning/In situ bioremediation
- 6. Customized biofloc/probiotics-based farming (in feed and/ or water)
- 7. Avoid overfeeding, excess use of chemicals and built up of vibrio
- 8. Encouraging functional feed and zero tolerance for antibiotics
- 8. Proper aeration management
- 9. Avoidance of all type of stressors



"Brackishwater aquaculture for food, employment and prosperity"

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