Use of Auto Feeder in Shrimp Pond at Mallam Village, Andhra Pradesh

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Abstract

Adoption of auto feeder technology in small and medium shrimp ponds is transforming feeding strategies in Andhra Pradesh. This article reports the case study of a 0.60 Ha Pond located in Mallam village, stocked with 4,00,000 post-larvae (PL) seeds, using C P Blanca Extra feed, and equipped with a single auto feeder. The experience demonstrates how feed automation enhances efficiency, reduces wastage, and improves growth performance.

Keywords

Shrimp aquaculture, auto feeder, Mallam village, CP Blanca Extra, feed management, Andhra Pradesh

Introduction

Shrimp aquaculture in Andhra Pradesh is evolving rapidly, with farmers seeking precision feeding solutions to optimize feed conversion ratio (FCR) and minimize labour dependence. Traditional hand broadcasting methods are often irregular, leading to feed loss, pond pollution occurs, and inconsistent shrimp growth. The installation of auto feeders in rural ponds is emerging as a practical innovation, especially when pond sizes are below 1.0 Ha.

Pond and Stocking Details

Location: Mallam village, Andhra Pradesh
Pond Size: 0.60 Ha (rectangular, earthen pond)
Seed Stocking: 4,00,000 post-larvae (PL)
Stocking Density: ~66 PL/m²
Feed Used: C P Blanca Extra
Feeding Technology: One centrally installed auto feeder

Criteria for Auto Feeder Use

Feeder Capacity: 60–70 kg capacity mounted on central platform
Coverage: Feeding radius ~20–25 m, sufficient for 0.60 Ha Pond
Programmed Feeding: Timer-based, 10 min intervals/rotation
Feed Quantity: Adjusted based on sampling & tray checks
Power Supply: Direct 3 Phase

Water Quality

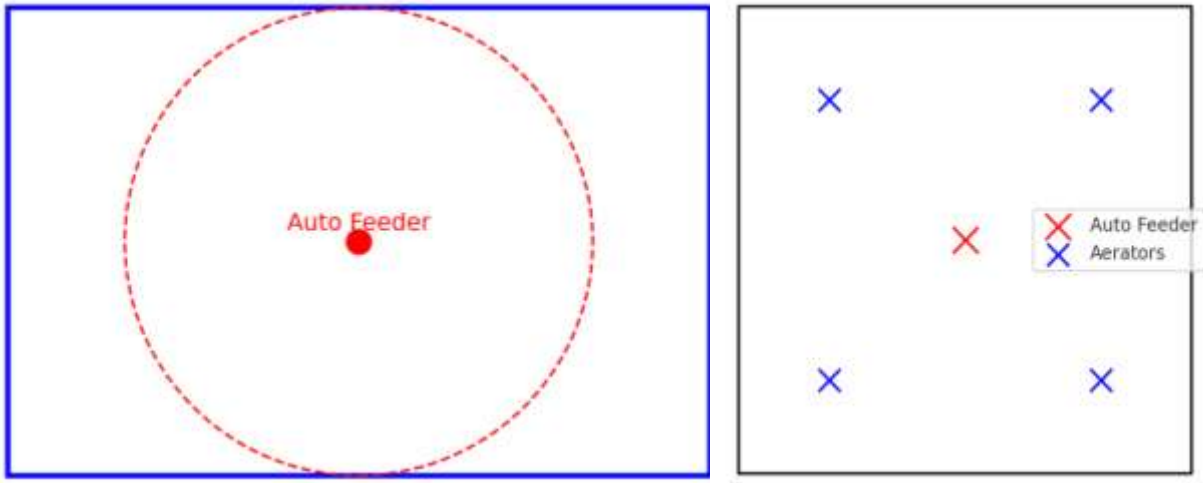
- DO levels maintained above 5.5 ppm
- pH level 7.7 in the morning & 8.2 in the evening (maintained level at full day 0.5)
- Total Alkalinity Level 130 ppm
- Ammonia and nitrite remained within safe limits (<0.2 ppm)

Water Quality & Soil Interaction

Gradual feed input prevented ammonia spikes. Nitrifying bacteria effectively oxidized ammonia. Heavy aeration ensured stable dissolved oxygen (>5 mg/L), minimized anaerobic black soil formation, and maintained favorable microbial balance.

Pond Layout Diagram

The diagram below illustrates the 0.60 Ha Pond with a centrally placed auto feeder and its effective feeding radius.



Observations and Results

- **Uniform feed distribution reduced crowding**
- **Improved water quality with lower organic load**
- **Growth and Survival: ABW 33.3 g at 90 DOC ; Survival ~90%; FCR 1.15**
- **Labour Efficiency: 70% reduction in broadcasting feed**
- **Economics: ~8–10% feed cost savings**

Advantages in the Pond

- Consistency in feeding ensured better growth
- Size variation reduced in seed population
- CP Blanca Extra feed supported stable performance
- Single auto feeder proved cost-effective for small pond
- Model is scalable for larger ponds with multi-feeders

Feeding Schedule

Days of Culture (DOC)	Feed Type & Size	Feeding Frequency
1–20	Crumbled C P Blanca Extra (PL starter)	4 times/day (small qty)
21–40	1.2–1.6 mm C P Blanca Extra pellet	4 times/day via auto feeder +Check tray monitoring
41–70	2.0–2.5 mm C P Blanca Extra pellet	4 times/day via auto feeder +Check tray monitoring
71–90	3.0 mm C P Blanca Extra pellet	4 times/day via auto feeder +Check tray monitoring

Challenges

- **Limited edge coverage, occasional manual feeding needed**
- **Dependence on power source or solar based battery backup**
- **Installation cost (~₹30,000–₹40,000) may limit adoption**

Feed Tank

Controller

Discussion

- **The results strongly highlight the advantages of auto feeders in semi-intensive shrimp culture:**
  Efficient Feed Utilization: Uniform feed dispersal prevented feed accumulation and bottom sludge, leading to a very favorable FCR of 1:1.15.
- Improved Shrimp Health: Reduced feed competition minimized cannibalism and stress.
- Operational Ease: Farmer dependency on labor-intensive manual feeding was reduced.
- Adaptive Stocking Strategy: The mid-culture seed transfer effectively reduced competition for space and oxygen.
- The combination of auto feeder + heavy aeration (30 HP) + Probiotic & Minerals Protocol+ split stocking + partial Harvest proved to be a sustainable and profitable management model for semi-intensive culture in Mallam village conditions.

Technical Report on Auto Feeder

Feed Dispersion Dynamics

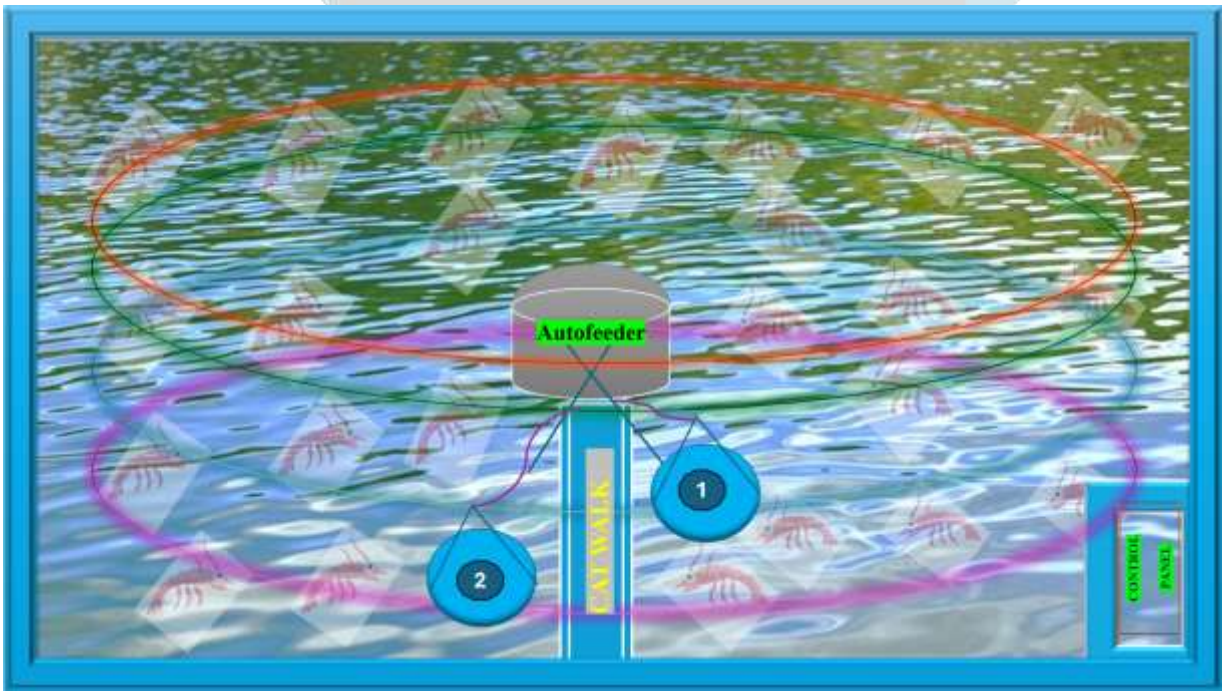
The auto feeder disperses pellets radially over a 20 m range. With central placement and strong aeration, coverage extended across ~75% of the 0.60 ha pond. CP Blanca Extra pellets, being slow sinking, allowed shrimp to feed in the water column, minimizing waste. Aeration currents assisted in distributing feed evenly and preventing localized accumulation.

Control panel setup

- In a day, full feed distributed into 2 segments like 60% in the first 2 meals (1st meal & 2nd meal) then 40% in the last 2 meals (3rd meal & 4th meal)
- For Nozzle rotation setup to disperse the feed in pond i.e. setup the timer like, Rotation time 20Sec & Interval time 12 Sec.; In One hour, based on the calculation the machine nozzles rotated 6 times to disperse the feed.
- In 20sec, the machine dispersed 2 Kg of total pond
- So based on feed consumption of animals by observed the check tray monitoring in every 1 hour, decided the timer setup like if the consumption reduced , increased the minute (Interval period) & reduced the second (Nozzle rotation period)

Synergy of Technology & Management

The integration of auto feeder and aeration acted as a bio-technical control system. Shrimp growth rate improved (2.8–3.5 g/week), survival reached ~80%, and uniformity improved (CV <12%).



- ❖ Install Check tray 1 near to the auto feeder machine & the check tray 2 put in the opposite direction
- ❖ Both check tray distance must be 2 mt gaps in between for proper feed estimation & shrimp health observation

This case study confirms that the use of a single auto feeder in a 0.60 ha pond, supported by heavy aeration and adaptive seed transfer, can deliver excellent production results within 80 days. The system achieved 30 count shrimp with an FCR of 1.15, setting a benchmark for feed

efficiency in Andhra Pradesh shrimp aquaculture.

The findings underscore that auto feeder adoption, even at small farm scales, significantly enhances production economics and environmental sustainability.

Power consumption calculation

e.g. Watt consumed = 100 Watt

Total time = 20 hours

Total day in a month = 30 Days

1 Unit electricity cost = ₹ 3.5

So, the calculation is as follows……

Watt consumed * Total time use *Total day in a month

100*20*30 = 60000 Watt

Next to convert this watt value to Kilowatt

So, 1 kW = 1000 Watt

60000/1000 = 60 kW

Next to convert this kW value to Unit

So, 1kW = 1 Unit

60 kW = 60 Unit

Next to calculate the rate of total used unit

So, 60*3.5 = ₹210

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