

# Shrimp Seed – A Critical Problem Faced by Shrimp Farmers – A Cross Sectional Analysis

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Seed is a major input in shrimp farming and all the farmers and entrepreneurs depend on hatchery seeds. For expansion of brackishwater shrimp farming, a regular and steady supply of quality shrimp seeds in large quantities at a given time for stocking is essential. Hatcheries are the source for the supply of quality hatchery seeds and stocking wild seeds is banned. Presently, in Tamil Nadu there are 68 shrimp hatcheries with a production capacity of 3000 million post-larvae. The survey was carried out in Nagapattinam and Thanjavur in two districts of Tamil Nadu. A sample of 300 shrimp farmers was interviewed randomly for the study. This paper presents the problems pertaining to shrimp seed encountered by the farmers and suggestions to overcome the same. The problems encountered by the farmers in both districts were lack of assurance on quality seeds, non-existence of government agency for regulating the price of seeds, high cost of seeds, non-availability of seeds from research institutes, inadequate supply of hatchery seeds, mortality of seeds during transportation, mixed seeds and deceptive method of counting the seeds. Suggestions given by them to overcome the problems were that the government research institutes should set up some more hatcheries and virus free Nauplius should be supplied to the farmers, assurance about seed quality from research institute and production of improved broodstock from government research laboratories. Since without a healthy broodstock shrimp farmers cannot hope to get quality seed, PCR was suggested as a sensitive diagnostic tool for detecting viral infection but due to various gaps in training this tool has not been used with consistent results.

*(Key words: Shrimp seeds, Broodstock, Quality control, Diagnostic tool, Supply and role of agencies)*

Globally, shrimp farming has been a significant agro-based economic activity since the early 1970s. Shrimp farming in India has been undergoing rapid technological transformation and it has gained extensive popularity. Seed is a major input in shrimp farming and all the farmers and entrepreneurs depend on hatchery seeds. For expansion of brackishwater shrimp farming, a regular and steady supply of quality shrimp seeds in large quantities at a given time for stocking is essential. To meet this requirement, to the extent possible, shrimp seeds are produced in the hatcheries and supplied to the farms. Hatcheries are the source for the supply of quality hatchery seeds and stocking wild seeds is banned. Presently, in Tamil Nadu there are 68 shrimp hatcheries with a production capacity of 3000 million post-larvae. Though about 55 species of shrimp are available in India, only 11 of them are considered suitable for culture. Among 11 species *Penaeus monodon* is widely cultured in the study area. This paper presents the problems encountered by the farmers pertaining to shrimp seed and suggestions to overcome the same.

## MATERIALS AND METHODS

The investigation was carried out in Nagapattinam and Thanjavur in the two districts of Tamil Nadu. The brackishwater area available in Nagapattinam, Thiruvarur and Thanjavur districts is 31,400 ha and the potential area readily available is 6292 ha. Total area under culture in Nagapattinam district is 1294.18 with water spread area of 989.93 as against 198.44 ha in Thanjavur district with water spread area of 139.69 ha (Anon, 2003). There were only 4 hatcheries functioning in and around Nagapattinam district and there were no hatcheries in Thanjavur. So, the farmers in both the districts totally depended on the hatcheries in and around Chennai. A sample of 300 shrimp farmers was interviewed randomly for the study. The respondents were asked open-ended question to elicit important problems faced by them. They were also asked to suggest measures which in their opinion would help solving the problems faced.

## RESULTS AND DISCUSSION

From Table 1 it could be observed that lack of assurance of quality seeds was reported by 80.67

percent of respondents in Thanjavur and 62.67 percent in Nagapattinam district. Many shrimp farmers in the study area reported frequent outbreak of viral diseases, which necessitated them to check the quality of seeds. Farmers normally selected healthy PL's based on physical appearance. But for quality assurance in recent years, modern biotechnological method like Polymerase Chain Reaction (PCR) is preferred which could detect the presence of small viruses. So they subjected the seeds to PCR tests. Farmers stated that the cost for checking the quality of seeds was high. While the farmers preferred PCR tests, the manipulation of seeds from some of the hatcheries was inevitable and they said the technical workers were mainly responsible for this malpractice.

Secondly non-existence of Government agencies for regulating the price of seeds was reported by 48.00 percent of the respondents in Nagapattinam and 42.66 percent in Thanjavur. The hatchery seeds were sold at exorbitant prices. So far the Government agencies have not taken any steps to regulate the price and make the hatchery authorities sell the seeds at reasonable cost.

The third major problem was high cost of seeds encountered by 45.33 percent of the respondents in Nagapattinam and 32.00 percent in Thanjavur district. It resulted in skyrocketing of prices and black marketing. There was no regulation over cost

and supply. The farmers requested the government agency to come forward and take interest in their welfare by regulating the prices of shrimp seeds at reasonable cost for the benefit of the farming community. Due to the scarcity of hatchery seeds, the wild seeds were also sold at exorbitant prices. Some of the respondents did not perceive the high cost of seeds as a problem because they were convinced that the high cost of seeds was compensated by high returns from shrimp farming.

Another seed oriented problem identified in the study area was non-availability of seeds from research institute as reported by 46.67 percent of the total respondents. They felt that promotional agencies should make sincere attempt to produce hatchery seeds for the farming community. Inadequate supply of hatchery produced seeds at appropriate time was a problem perceived by 26.00 percent of respondents in Nagapattinam and about 19.33 percent in Thanjavur. Some of the respondents informed that the same problem was very severe during the year 1994. It was also reported by some that the price of the wild seeds had gone up to Rs 200-250 per 1000 during 1993 and to about Rs 500-750 per 1000 numbers during 1994. In spite of the problem of inadequate supply of hatchery seeds, they had to forgo the culture and were not able to take up the culture at a particular time.

*Table 1. Problems pertaining to shrimp seed*

Types of problems	Nagapattinam n=150	Thanjavur n=150	Total n=300*
Lack of assurance on quality seeds	94 (62.67)	121 (80.67)	215 (71.67)
Non-existence of government agency for regulating the price of seeds	72 (48.00)	64 (42.67)	136 (45.33)
High cost of seeds	68 (45.33)	48 (32.00)	116 (38.67)
Non-availability of seeds from research institutes	65 (43.33)	75 (50.00)	140 (46.67)
Inadequate supply of hatchery seeds	39 (26.00)	29 (19.33)	68 (22.67)
Mortality of seeds during transportation	25 (16.67)	32 (21.33)	57 (19.00)
Mixed seeds	17 (11.33)	19 (12.67)	36 (12.00)
Deceptive method of counting the seeds	11 (7.33)	5 (3.33)	16 (5.33)

\* Multiple responses (Figures in parentheses indicate percentage to total)

**Table 2.** Suggestions pertaining to shrimp seed

List of suggestions	Nagapattinam n=150	Thanjavur n=150	Total N=300*
Government research institutes should set up some more hatcheries and virus free Nauplius should be supplied to the private hatcheries	90 (60.00)	117 (78.00)	207 (69.00)
Assurance about seed quality from research Institute	58 (38.67)	72 (48.00)	130 (43.33)
Production of improved broodstock from government research laboratories	54 (36.00)	71 (47.33)	125 (41.67)

\* Multiple responses ( Figures in parentheses indicate percentage to total)

About 16.67 percent of respondents from Nagapattinam and 21.33 percent from Thanjavur reported that the seed transportation from hatcheries to several farming areas was time consuming and stressful. Prolonged transportation of seed often packed in poor quality cardboard boxes caused stress rendering them weak and susceptible to disease by the time they arrived at the farming site for stocking.

Some 14.00 percent of the respondents in Nagapattinam and 12.67 percent in Thanjavur reported that certain hatcheries had supplied seeds of mixed ages. Out of the total respondents only about 5.33 percent of the respondents encountered the deceptive method of counting the seeds as one of the problem. As there was heavy demand for shrimp seeds during 1994, some of the hatcheries were reported to indulge in the malpractice. The farmers could not insist on proper counting of seeds because of heavy demand for shrimp seeds. Similar findings such as shortage of quality seeds were reported by Gopinathan and Deboral (1995), high cost of seeds by Sakthivel (1997) and Lekshmi (2004), inadequate supply of seeds by Anon. (1992), Rao (1997) and deceptive method of counting the seeds by Chand (1992). The suggestions given by the respondents who faced this problem are discussed below and the pooled data are presented in Table 2.

About 78.00 percent of respondents in Thanjavur and 60.00 percent in Nagapattinam suggested that the shortage of seed should be overcome and that modernized/ improved seed production should be taken up in the private sector. Further, to the supply of quality seed, a directory of seed producers/ suppliers/ rearers has to be prepared at the district level by the Brackishwater Fish Farmers Development Agency and Marine Products Export Development Authority and supplied to the farmers.

Farmer's experiences have shown that stocks whose samples give negative results in PCR test sometimes turn out to be WSSV positive. If government PCR is made to function properly, more number of farmers will be benefited by viral free shrimps.

Thus setting up of accrediting bodies with quality control labels like Agmark as in agriculture may be followed for aquacultural inputs (Lekshmi, 2004). Attempts should be made to set up government shrimp hatcheries of required capacity to meet the seed requirements of the farmers of both the districts. For this, the project cost for such hatchery may be high, a part of which may be financed by the farmers, entrepreneurs, seafood processors/exporters.

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