

Giant Freshwater Prawn Culture

Site selection and farm construction:

Selection of suitable site is pre-requisite for establishing a prawn farm. Farming site should be connected to approachable road for transportation of seed, fertilizers, feeding materials, farm equipment. Soil and water testing may be carried out before farm construction for assessing the productivity status, water holding capacity of the soil. Sandy-clay or sandy loam soil is suitable. For establishing the prawn farm the pond should be prepared in such a way that entire water may be drained out. The pond size can ideally vary between 0.1 and 1 ha area. Since prawns are migratory in mature, they try to migrate from one pond to other during rainy days and cool weather.



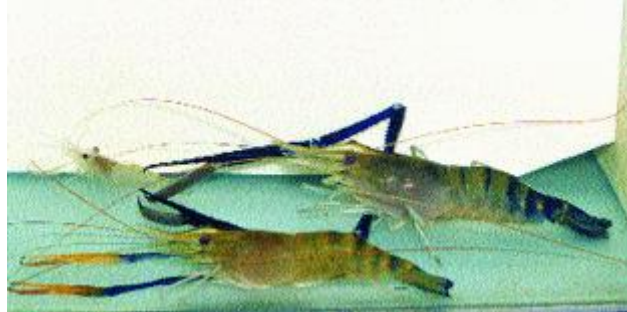
Farm construction with appropriate depth and dyke height

Therefore the bund height of the pond should be at least 0.5 m above the water level. While the depth of pond should not be more than 1.5 m, as it affects the growth of prawn. Layering the bottom of the pond with sand or small pebbles with hide outs helps in movement and shelter to the prawn, leading to the increase in production capacity.

Preparation of pond:

To kill the unwanted fishes Mahua oilcake is applied @ 2,500 kg/ha. Alternatively combination of urea @ 100kg and bleaching powder @ 200 kg/ha can also be used, with urea applied 18 h before the bleaching powder application. In a newly excavated pond 5-7 tonnes cow dung/pig manure and 200-500 kg lime/ha should be applied. To maintain the planktonic population in the pond, organic and inorganic fertilizers like poultry droppings, pig and cow manure may be applied after stocking of juveniles at periodical intervals. In prawn farming Calcium form an important component in

moulting process. Therefore after a heavy shower calcium level in the water may decrease which is signaled by lowering of water pH. If the pH decreases below 6.5, the molting process is arrested. For this purpose, 50 kg lime/week should be applied to maintain calcium balance in water.



Male morphotypes of M. rosenbergii

Prawns are cannibalistic in nature and having territorial behavior. During starvation they attack the weaker members of their own group. To prevent such situations special arrangements may be made by providing hide outs during moulting time. Water hyacinth can be kept in the pond under bamboo frame. Apart from this large palm leaves, plastic pipes, small asbestos sheets can also be used.

Rearing of postlarvae in nursery:

It is observed that releasing the post-larvae directly into the pond results in poor survival, emphasizing raising the PL in nursery pond till 30-50mm.



Concrete tanks for nursery phases

Concrete tanks are usually used for nursery cycle. Complete drainage of water from such nursery tanks helps for easy harvesting of the juveniles. Earthen ponds are not suitable for nursery rearing as continuous aeration makes the water muddy, beside wastage of feed through mixing with the mud and its further decomposition leading to decrease in dissolve oxygen levels and microbial infection. As soon as the postlarvae

becomes juveniles, they should be reared in low saline water of 3-7‰. Before stocking of juveniles in rearing ponds physico-chemical parameters of the water like Dissolved oxygen, temperature, pH, NH_4 , Ca^{+2} , and Mg^{+2} should be analysed and need to be kept within desired limit. Depending upon the water volume 5-10 PL/lit should be stocked for 2-4 weeks. During this period provision of shell strings has to be made so that they can hide while moulting. Groundnut oilcake, small mussel, chicken feed, fish meal with 30-40% protein may be used as feed. Juveniles attain 40-60mm within a rearing period of 2-4 weeks,



Juveniles of M. rosenbergii

which can be transferred to the grow-out ponds. Starting from breeding to larval rearing one complete cycle requires around 2-3 months.

Rearing into grow-out ponds:

On arrival at the pond bank utmost care should be given to acclimatize the juveniles to the temperature by floating the transport bags in the pond for 15 minutes before emptying them into the water (as shown in figure). Severe mortalities can be caused not only by thermal shock but also by sudden changes in pH. If the water pH is more than 0.5 pH units different from the pH in the juvenile holding tank or the nursery ponds, acclimatize the juveniles to this pH level slowly (over a one-day period) in nursery before transporting and stocking them at the grow-out pond. Generally for better growth in semi-intensive, stocking rates vary between 4 and 20 PL/m² (40 000-200 000/ha). In stagnant water where facility for water exchange is not available stocking density should be kept between 30,000 to 50,000 juveniles/ha. During this period 30-40% crude protein out of which 50% should be from animal origin and 50% from plant origin is given as diet. The feed is provided @ 3-10% of the standing biomass/day in two rations during morning and evening.



Acclimatization with pond water temperature and release of juveniles into grow-out ponds

In addition to feed, suitable water conditions also required for better growth and survival i.e temperature 26-32°C, pH 7-8.5, DO > 2.5 ppm, total hardness 100-150 ppm, calcium 30-80 ppm, phosphorus 0.01-0.9 ppm and nitrogen 0.05-0.5 ppm. Any imbalance of these parameters affects the growth as well as production. Prawn being a bottom dwelling animal, the optimum growth and development depends upon the pond soil, which should be alkaline. Therefore to make soil fertile, fused lime should be applied.

The culture practice of *M. rosenbergii* may be categorized as i) monoculture ii) polyculture iii) integrated culture

Monoculture of *M. rosenbergii*:

A stocking rate of about 4 juveniles/ m² (40 000/ha) is recommended for the monoculture of *Macrobrachium rosenbergii*. There are some advantages in using larger juveniles for stocking. For example, it has been demonstrated that increasing the average stocking weight at 4 animals/m² from 0.17 g to 0.75 g increases production at harvest by nearly 30%. However, this stocking size advantage does not apply indefinitely; research has shown that stocking 3 g animals did not improve production because the animals matured too rapidly. In addition, grading nursed juvenile prawns before stocking also has significant advantages under monoculture practice. It has been found to increase average harvest size and total pond production. Size grading is a way of separating out the faster growing prawns and lowering the suppression of growth that they cause to other prawns; it can also result in improved

feedconversion ratios (FCR). Another means of improving in production freshwater prawn culture is to place artificial substrates in the ponds, which makes it feasible to increase stocking rates above the level recommended earlier for ponds without substrates. PVC fencing.

Polyculture of *M. rosenbergii*:

Records exist of the polyculture of various *Macrobrachium* species in combination with single or multiple species of fish, including tilapias, common carp, Chinese carps, Indian carps, mullets, ornamental fish. Other combinations may be feasible. The inclusion of freshwater prawns in a poly-culture system almost always has synergistic beneficial effects, which include:

Integrated culture with *M. rosenbergii*:

The wastewater from ponds containing prawns being reared in monoculture or polyculture with fish can be used for the irrigation of crops. Prawns can also be reared in paddy fields, without depressing rice production. This has proved especially valuable in Viet Nam, where it has been shown that the income from prawns in integrated rice-prawn culture can be two or three times as great as that from the cultivation of rice. The introduction of freshwater prawns reduces the area devoted to rice paddy (because deeper areas where prawns can shelter when the rice field is dry have to be provided). It also reduces weeding costs (prawns eat weeds) and fertilization costs.

Prawns being a high value commodity and possessing great potential for export offer greater scope for their larger scale adoption both under monoculture and polyculture. In India, MPEDA is providing incentives and technical assistance for the development of prawn farming, greater R&D interventions and credit support given in recent years is expected to boost the growth of prawn seed production and farming in the country.