

SHRIMP CULTURE: POND PREPARATION



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Table 3. Amount of fertilizers to be applied.

Available Nitrogen in Soil (mg/100 g Soil)	Urea to be added (kg/ha)	Available Phosphorus in Soil (mg/100 g Soil)	Single Super Phosphate to be added (kg/ha)
12.5	100	1.5	100
25.0	50	3.0	50
50.0	25	6.0	25

The colour of water will become brown with a yellowish hue indicating that the pond is ready for stocking the seed. The pond water will have a Secchi disc reading around 40 cm, stable pH and rich algal bloom of brown colour.

4. Fouling associated with pond bottom and water quality

External fouling found in the reared shrimp is usually associated with deterioration of soil quality in the pond bottom or the water quality. The first priority, therefore, is to ensure a clean environment for the shrimp to live and grow.

The most commonly used compound for this purpose is formalin (37 to 40% formaldehyde). The dose of formalin required to treat external fouling in shrimp ponds is much lower than that used for finfish.

Pond disinfectants

Various chemicals have been recommended for reducing the load of harmful bacteria in the pond system. There is very little evidence to prove the efficiency of these compounds. Most of the recommended substances are broad spectrum disinfectants like:

- Quaternary ammonium compounds eg Benzalkonium chloride (BKC),
- Buffered iodophores,
- Calcium Hypochlorite and
- Bioaugumenters.

5. Management of Pond Bottom During Culture

During culture, inputs like high energy protein feed, fertilizers, etc., are added to the pond. The unconsumed feed settles at the pond bottom. The carbonaceous matter, suspended solids, faecal matter and dead plankton etc., also settle at the pond bottom. These materials adversely affect the environment. To understand the deterioration of the pond bottom, the following parameters are to be monitored regularly:

1. pH of soil : It will show acidic reaction.
2. Organic Matter : It will increase as the culture progresses.
3. Redox Potential : Increase in value towards negative range.

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SHRIMP CULTURE

POND PREPARATION

There are various aspects in pond preparation, which should be carried out before the pond is used for shrimp culture for the first time and for the subsequent crops. The main objectives of pond preparation are to provide the shrimp with a clean pond base and appropriate stable water quality.

1. Cleaning

During shrimp production cycle, considerable quantity of organic waste accumulates in the ponds depending upon the culture practices followed. This waste must be removed to ensure sustained shrimp production from the pond. Removal of waste is done by dry method or wet method.

1.1. Dry Method

In this method, after the final harvest, the pond bottom is allowed to dry and crack, primarily to oxidize the organic components, left-over in the pond after the previous culture. The pond bottom

should be dried for at least 7-10 days and the soil should crack to a depth of 25-50 mm. After drying, the waste can either be removed manually or mechanically.



Ploughed shrimp pond

1.2. Wet Method

In this method, after the final harvest, the accumulated black material at the pond bottom is flushed out in the form of a thin slurry using a heavy duty pump.

2. Liming

After the waste is removed, the pond should be filled with water to flush out fine debris and also to check the pH of the water. This water should be left in the pond overnight and then drained / pumped

out. This process should be repeated until the pH of the water remains above 7.0.

After the final flush, the soil pH is checked and lime should be applied immediately as per Table 1, depending upon the lime materials available in the area.

Table 1. Amount of lime required (tons/ha) to raise the soil pH to 7.0.

Soil pH	Quantity of lime materials (tons/ha)				
	Agri. Lime	Dolomite	Hydrated lime	Quick lime	Shell Powder
6.5	2.8	2.8	4.2	2.3	3.2
6.0	5.5	5.7	8.5	4.6	6.4
5.5	8.3	8.5	12.7	6.9	9.6
5.0	11.1	11.3	17.0	9.2	12.8
4.5	13.9	14.2	21.2	11.5	16.0
4.0	16.6	17.0	25.5	13.8	19.2



Water intake system

The lime is evenly spread over the entire pond bottom with little moisture and upto the top of the dike. The pond is left undisturbed for 10-15 days. Ploughing and tilling are recommended only if the pond is deeply contaminated. Effective plough depth is 15 cm. A large proportion of the lime needs to be applied along the feeding areas and on the wet portions of the pond.

Finally, the pond should be filled with brackishwater upto 30 cm and drained after 3 days.

3. Manuring, fertilisation and filling

Application of dry cattle dung/chicken manure should be done, depending upon the organic carbon content of the soil before re-filling the pond to 50 cm. The recommended doses are given in Table 2.

Table 2. Amount of manures to be applied

Organic Carbon in Soil (%)	Amount of manure to be applied (kg/ha)	
	Cattle Dung	Chicken Manure
1.0	500	or 167
0.5	1000	or 333
0.25	2000	or 666



Application of manure

15-20 kg/ha of tea seed cake should be added. Recommended level of application of tea seed cake for salinity above 15 ppt is 20 g/m². Tea seed cake should be ground and soaked in water for 24 hours before application.

The pH of water should be maintained between 7.5-8.5. The pH adjustment can be done by adding lime.

Addition of 15 cm of water should be carried out everyday until the depth of pond water reached 100 cm. Inorganic fertilizers (urea and single superphosphate) can be applied depending upon the available nitrogen and phosphorous in the soil (Table 3).

The fertilizers are dissolved in water and evenly spread over the surface of the water in the pond.