

FISH POND MANAGEMENT

Dr. S.P. Sahu

Assistant Professor (LPM)

Bihar Veterinary College, Patna

Nursery Pond Management

- Used for spawn (5-8mm) to fry stage (25-30mm).
- Spawn starts external feeding after 3 days of hatching.
- Needs congenial environment with enough food for growth and survival.

Selection of Pond:

- Area: 0.02-.05 ha water depth: 1.0-1.5 m.
- Seasonal pond is preferred over perennial pond.
- Seasonal pond is relatively free from weeds and unwanted fishes.
- Prevent entry of ducks and predatory fishes.

Clearance of weed and unwanted fishes:

- For free movement of fry and production of natural food.
- Done during summer months (April-May).
- Unwanted fishes compete for food, space and oxygen and a great cause of predation of fry.
- Eradication by repeated netting, complete drying of pond and application of fish toxicants.

Fish toxicants:

- **Mahua cake:** 4-6% saponin. Kills fishes @200-250ppm in 3-10 hrs. Toxicity lasts for 20-25 hrs. fishes fit for human consumption. Also acts as organic fertilizer. @ 2000-2500 kg/ha for 1m water depth.
- **Tea seed cake:** Rate: 75-100 ppm. Toxicity lasts for 10-12 days. Also acts as organic manure for the pond.
- **Ammonia:** Anhydrous ammonia @ 20-25 ppm. Toxicity lasts for 35-40 days. Also acts as herbicide and fertilizer.
- **Bleaching powder:** 25-30 ppm. Toxicity lasts for 7-8 days. Cheap. Oxidising the decomposing matter on the pond bottom.

Liming of Pond: by Quicklime

- Mineralization of organic matter.
- Used after 2 wks of eradication of unwanted fishes @ 200-300kg/ha.

Manuring of pond:

- For encouraging the growth of plankton (animalcules): natural food of spawn.
- Cattle dung @ 10,000kg/ha before 10-15 days of stocking.
- In case, mahua cake is used as fish toxicant, manuring is not essential.

Control of aquatic insects:

- To prevent prey upon the spawn/early fry.
- Common insects are beetle, bugs, dragonfly etc.
- **Soap oil emulsion:** washing soap+veg. oil (18:56) per ha by heating the mixture and sprayed on the surface of water.
- Applied 12-24 hrs before stocking.
- **Kerosene oil:** @ 80-100 lit./ha
- **Diesel:** mixture of diesel (1 lit),0.75 ml emulsifier hyoxid 1011 and 40 ml water @ 1041 ml/200 sq. m.
- **Terpentine oil:** @ 75 lit/ha

Control of aquatic insects:

- To prevent prey upon the spawn/early fry.
- Common insects are beetle, bugs, dragonfly etc.
- **Soap oil emulsion:** washing soap+veg. oil (18:56) per ha by heating the mixture and sprayed on the surface of water.
- Applied 12-24 hrs before stocking.
- **Kerosene oil:** @ 80-100 lit./ha
- **Diesel:** mixture of diesel (1 lit),0.75 ml emulsifier hyoxid 1011 and 40 ml water @ 1041 ml/200 sq. m.
- **Terpentine oil:** @ 75 lit/ha

Stocking of Spawn:

- Stocking after complete detoxification of pond.
- Fixing a hapa in the pond and releasing of spawn in it.
- Comfortable behaviour of spawn for 24 hrs confirms the complete detoxification of pond.
- Stocked with 3-4 days spawn @ 25-35 lakh/ha in the morning hours.

Supplementary Feeding:

- For better growth of fry in the pond.
- Mixture of finely grounded GN cake/mustard cake + rice bran (1:1).
- Also supplement cobalt manganese sulfate @0.01mg/day/spawn in feed.
- Broadcast the feed daily in the morning.
- Feeding stopped one day before harvesting.

- 1-5th day: 4 times of initial body wt. of spawn stocked:
0.56kg/lakh spawn/fry.
- 6-12th day: 8 times of initial body wt. of spawn stocked:
1.12kg/lakh spawn/fry.
- 13th day: no feeding
- 14th day: harvesting

Harvesting of Fry:

- Fry: 25-30 mm in 2 weeks
- Harvested with fine meshed (1.5mm) dragnet in morning cool hours.
- Avoid cloudy day.

Rearing Pond Management

- Used for rearing of fry stage (25-30mm) to fingerling stage (100-150 mm) for a period of 3 months.

Selection of Pond:

- Area: 0.05-0.10 ha water depth: 1.5-2.0 m.
- Seasonal pond is preferred over perennial pond.
- Seasonal pond is relatively free from predatory fishes.
- Prevent entry of ducks.

Eradication of weed and removal of unwanted fishes:

- Eradication by manually repeated netting, complete drying of pond and application of fish toxicants.

Pond Fertilization:

- Liming of pond @250-300kg/ha in 3 equal installments. 1st dose one week before stocking.
- Cattle dung: @2500kg/ha in 4 equal installments. Initial dose fortnight before stocking and then monthly intervals. In case of mahua cake, initial dose is not required.
- Inorganic fertilizers: urea @ 100kg/ha, SSP @ 100kg/ha in 3 equal installments. 1st intl. on 2nd day of stocking and monthly intervals.

Stocking of Fry:

- Stocking after complete detoxification of pond.
- Stocked with 25-30 mm fry @ 2-3 lakh/ha
- C+R+M- 2:4:4
- SC+ GC- 1:1
- SC+GC+CC-4:3:3
- SC+GC+CC-5:1.25:3.75
- C+R+M+CC-4:3:1.5:1.5
- C+R+M+GC- 3:1.5:2.5:3
- SC+GC+CC+R-4:2:2:2

Supplementary feeding:

- To achieve higher plankton production for heavy stocking density.
- Mixture of finely grounded GN cake/mustard cake + rice bran (1:1).
- Broadcast the feed daily in the morning.
 - 1st month: 6 kg feed/lakh/day
 - 2nd month: 10 kg feed/lakh/day
 - 3rd month: 15 kg feed/lakh/day
- Feeding suspended in case of algal bloom.
- Provide duckweed (Wolffia, Lemna and Spirodella) for grass carps in bamboo enclosures at one corner of the pond in required quantity.

Harvesting of fingerlings:

- Growth of fry checked periodically by drag netting.
- Healthy fingerlings (100-150 mm) obtained in 3 months rearing periods.
- Supplementary feeding stopped one day before harvesting.
- Harvesting done by repeated drag netting in cool morning hours.
- Survival of fingerlings: 70-90% (av. 80%) in 3 months of rearing.

Stocking Pond Management

- Used for rearing of fingerlings to marketable size.
- Composite fish culture: Full utilization of pond productivity at different ecological niches by culturing together fast growing six compatible species of fishes of complementary feeding habits.
- Carrying capacity of pond is enhanced by using manures and fertilizers in addition to providing nutritive supplementary feed.

Selection of Pond:

- Area: 0.1-2.0 ha Water depth: 2.0-3.5 m.
- Perennial ponds preferred over seasonal ponds.

Control of Aquatic Weed:

- Upsetting the pond nutrients, oxygen balance, penetration of sunlight, reducing natural productivity, creating obstruction in movement of fishes, netting operations etc.
- **Free floating surface weed:** Water Hyacinth, Pistia, Lemna.
- **Submerged weed:** Hydrilla, Najas, Ceratophyllum, Ottelia, Vallisneria.
- **Rooted emergent weed:** Lotus, Lilies, Nymphoides, Euryale, Trapa.
- **Marginal shallow water weed:** Aquatic grasses (Panicum) sedges, rushes (Cyperus, Typha), creepers, bushes.
- **Algae:** Microcystis, Anabaena, Euglena, Spirogyra, Pithophora
- **Manual method:** By manual labour in small ponds.

- **Mechanical method:** by manual labour, sickle and barbed wire in small ponds.
- **Chemical method:** by use of herbicides which later on also acts as fertilizers.
- **Biological method:** by use of grass carp (200 mm and above size).

Eradication of Unwanted Fishes:

- By repeated netting and use of fish toxicants like mahua cake, tea seed cake which also acts as organic manure in fish pond.
- Bleaching powder: 25-30 ppm. Effective in 3-4 hrs. toxicity lasts for 7-8 days. Also disinfecting effect and oxidizing the decomposed matter on the pond.

Limiming:

- For mineralization of organic matter of pond and prophylactic measure.
- Quick lime @ 400 kg/ha – Initial dose @ 100 kg/ha 1 week earlier of stocking of pond and rest in monthly equal installments.
- In distress condition of fishes @ 15-200 kg/ha.

Manuring of Fish Pond:

- Organic manure: initial dose @20% of total requirement before 15 days of stocking.
- Remaining 80% of organic manure in 11 equal monthly installments.
- When mahua cake is used as fish toxicant- no need of first installment.
- Total quantity of inorganic fertilizers in 11 equal monthly installments.

- Organic manure and inorganic fertilizers used alternatively at fortnight intervals.

Select nitrogenous fertilizers on the basis of soil reaction:

- For acidic soil (pH 5.5-6.5)- Cal. Amm. Nitrate
- For neutral soil (pH 6.5-7.5)- Urea
- For alkaline soil (pH above 7.5)- Amm. Sulfate

Cowdung-	2000 kg/ha-initial dose
Cowdung-	1000 kg/ha – monthly
Urea -	25 kg/ha - monthly
Amm. Sulfate-	30 kg/ha - monthly
Cal. Amm. Nitrate-	30 kg/ha - monthly
SSP-	20 kg/ha - monthly
TSP-	8 kg/ha - monthly

Stocking of pond:

- Judicious selection of compatible fast growing economic species for maximizing fish production.
- Combination of 6 species: Rohu, Catla, Mrigal, Silver Carp, Grass Carp and Common Carp.
 - Catla and silver carp: **Surface feeder**
 - Rohu: **Column feeder**
 - Mrigal and common carp: **Bottom feeder**
 - Grass carp: **Macro-vegetation feeder.**
- Generally try above 6 species or 4 species (catla, rohu, mrigal and common carp) for max. yield.

- **6 species culture:**

Surface feeder: 30-40% (C-10-15%, SC-20-30%)

Column feeder: 15-20% (Rohu)

Bottom feeder: 40-45% (M-15-20%, CC-20-25%)

Micro-veg. feeder: 5-15% (GC)

- **4 species culture:**

Catla: 30-40%

Rohu: 20-30%

Mrigal: 15-20%

Common carp: 20-25%

- **3 species culture:**

Catla: 40% Rohu: 30%

Mrigal: 30%

Stocking rate:

- Depends on fertility of pond and measures adopted for increase of biological productivity by fertilization and supplementary feeding.
- A pond with water depth of 2.0-3.0 m: 5000 fingerlings/ha.
- Stocking at different times to reduce interspecific competition (catla and silver carp- 2 month later of catla).
- Size of fingerlings: 100-150 mm for better survival.

Supplementary Feeding:

- Carp fish feed: Protein: 25-30, CHO: 30-40%, energy: 3.5-4.0kcal/g, Lipid+vit.+min.: 5-10%.
- GNC/MC and rice bran: 1:1 by wt.
- Feeding rate: 2+3% of bwt.
- Monthly sampling of fish by dragnet.

- Feed required for stocking 5000 fingerlings/ha:

1st month: 4kg/day

2nd month: 5kg/day

3rd month: 6kg/day

4th month: 8 kg/day

5th month: 10 kg/day

6th month: 12 kg/day

7th month: 14 kg/day

8th month: 16 kg/day

9th month: 18 kg/day

10th month: 20 kg/day

11th month: 22 kg/day

12th month: 24 kg/day

- For grass carp: *Hydrilla*, *Najas*, *Ceratophyllum*, *Wolffia*, *Lemna*, *Azolla* and *Spirodela* a/c to their consumption.

Water Management:

- Maintain av. Water depth.

Yield:

- Wt.: 1 kg and above- more market price.
- Carps attain atleast 1 kg body wt. in a period of 12 months.
- Fish farmers Av. Production: 4t/ha/yr
- CIFRI production: 10t/ha/yr

THANKS