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A carp hatchery: Its essential components, site, proper hatchery operation procedures

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The Site

The following can be an ideal site for a carp hatchery:

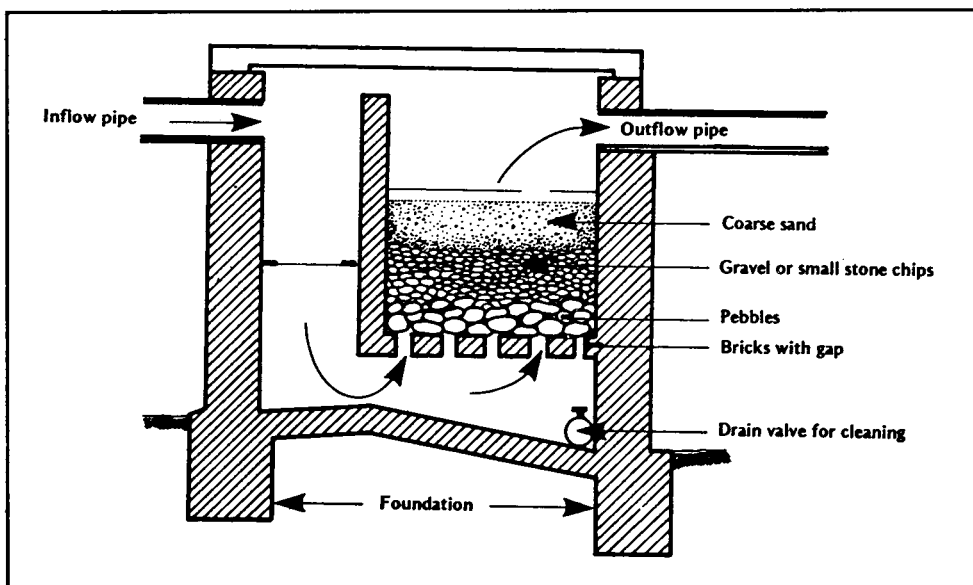
- ponds excavated at the site should provide a water retentive soil base, exposed by digging or transfer of top soil of the site to pond bottom and embankments;
- the pond bottom soil should possess basic mineral nutrients and respond readily to organic and inorganic fertilization;
- there should be an adequate source of water to supply the proposed hatchery;
- self-draining ponds can be constructed on sloping sites;
- the physical and chemical properties of the water are within the acceptable limits, such that water quality can be further manipulated by chemical treatment to suit aquacultural needs;
- the site is easily accessible by any means of transportation;
- there is a market in the vicinity;
- fertilizers and raw material for feeds required for aquaculture operations and building material

for constructing the hatchery are available near the site;

- there is no industrial, domestic or pesticide pollution at the site;
- there are reasonable educational and medical facilities available in the vicinity of the site;
- there may be scope for integration of aquaculture with agriculture, horticulture or floriculture at the site.

Essential components of a hatchery

- broodstock ponds to hold adult fish for spawning or serving as donors of pituitary glands and to accommodate spent females and males;
- a hatchery proper comprising a recuperating complex of facilities for fish spawning, hatching and care of hatchlings up to postlarval stage;
- nursery ponds for rearing postlarvae to fry stage;
- rearing ponds for growing fry to fingerlings;
- ponds for mature and maturing adults.



A reverse flow filter

These recirculating hatching tanks are suited for medium-to-large-scale bighead carp hatchery



Proper hatchery procedures

- Before releasing any broodstock, the ante-tank should be filled with pond water and an anti-septic substance.
- To prevent broodstock from jumping out, the ante-tank should be covered with netting having weights (like seine-net-sinkers).
- Only filtered, clear, cool, clean and oxygenated water at 27°C should be used in circular tanks.
- Its water level and outflow should be controllable by operating turn-down pipes.
- The rate of flow of water in the circular tank should be 30-45 liters per minute.
- There should be a net cover with sinker-like weights for the breeding tank which should be used to cover the tank after the broodstock have been injected and released in it.
- To safeguard against unexpectedly early breed-

Note: *A study conducted at SEAFDEC showed that the water hardness concentration significantly affects hatching rate of silver carp eggs. A water hardness of 300-500 mg/l CaCO₃ is recommended for the successful hatching of silver carp. The paper entitled "The Effects of Water Hardness on the Hatching and Viability of Silver Carp (*Hypophthalmichthys molitrix*) Eggs" from this study, won A. Gonzal and his co-authors E.V. Aralar and J. F. Pavico the Naga Best Paper Award in 1989. Ed.*

ing after injection (or occasionally even without injection) screens should be put in position.

- After spawning has taken place, a circular air diffuser should be installed at the base outside the screen and air from compressor or blower bubbled to keep the screen free from eggs.
- Spawners must be removed from the circular tank after eggs have been completely spawned. They must be given prophylactic treatment in ante-tanks before releasing in a broodstock pond or spent fish pond for possible subsequent maturity.
- After hatching has occurred, the rate of flow of water through the circular tanks should be increased to 45-50 liters per minute and a 5-8 mm meshed nylon net stretched across the tank in a slanting position to collect the discarded egg shells. The nylon net should be retrieved every few minutes to collect cast-off egg shells.
- If the clogging caused by egg shell bits is not remedied, the central screen fitted into the drain should be carefully replaced by a new one.
- The hatchlings may be left in the circular tank for four days if a second shift of egg nursing is not to be undertaken. If a second shift is to be undertaken within this period, then the hatchlings should be seined off and removed to the ante-tank.
- It is essential to periodically brush and hose-wash the screen and keep it completely clean after it has been used once in a breeding tank for few continuous days.

Source: Jhingran, VG and RSV Pullin. 1985. A hatchery manual for the Common, Chinese and Indian major carps.