

Southeast Asian Fisheries Development Center

Aquaculture Department

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Aqua Farm News

1993

Nursery system for carps

Aquaculture Department, Southeast Asian Fisheries Development Center

Southeast Asian Fisheries Development Center, Aquaculture Department (1993). Nursery system for carps. Aqua Farm News, 11(1), 11-12.

<http://hdl.handle.net/10862/2548>

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Carp breeding using wheat fields off season

About 300,000 ha of wheat fields around Jabalpur, Madhya Pradesh become rainfed ponds (*havelis*) from July to October. Rainwater is impounded in these fields (with dikes about 1 m high) until the onset of winter when they are drained, plowed, and the wheat is sown. For a period of 3-4 months, the field can be used for seed production of common carp.

For a 0.4 ha field, the following procedures could be followed:

- Select a field near the road but away from flood-prone zone. Check the dikes and put meshed screens on the inlets and outlets.
- Spray an emulsion of 20 liters diesel and 7 kg of cheap washing soap on the water surface to kill predatory aquatic insects as soon as about 60-80 cm of water has accumulated in the field.
- After spraying, release 4 healthy and fully ripe females with 4 males, each weighing about 1 kg. A fully ripe, healthy female has a swollen abdomen and a reddish genital region. Males ooze milt with gentle pressure on the abdomen. Provide 2-3 kg of *Hydrilla* or *Eichornia* at 3 or 4 places in the field.

The fish breed within 24-48 h of stocking, or may take a day or two more if they are not fully ripe. The eggs are laid on the weeds and hatch within 48-72 h. Harvesting of fry can be done after 15-20 days; the yield is about 100,000 fry 25-30 mm in size. If the field is manured with 2,000 kg cowdung and the fry are given an artificial feed made of groundnut oil cake and rice bran (1:1 by weight), about 20,000 fingerlings 40-60 mm in size may be harvested.

Source: International Institute for Rural Reconstruction and International Center for Living and Aquatic Resources Management. 1992. *Farmer-proven integrated agriculture-aquaculture: an information kit*.

Nursery system for carps

A nursery is a facility where fish fry can grow. Efficient fish culture requires special nurseries for growing fry prior to stocking in grow-out ponds. The ideal size of a nursery is 200-500 m² with a depth of 1.0-1.5 m.

Pond preparation

- Remove all aquatic weeds (Day 1).
- Drain and dry the pond (Day 2).
- Apply 5-6 kg lime to release nutrients and kill harmful organisms in the pond (Day 16).
- Apply fertilizer 3 days after lime application and 7-10 days before stocking. Refill water if necessary (Day 19).

The test for the growth of natural food (plankton) is simple. Dip an arm in the water up to the elbow. If the hand can not be seen, the plankton is probably sufficient.

Stocking

Stock 60,000-70,000 larvae (4-5 days old) or older fry. The stock should be of the same age and size, vigorous, and released in the morning or late afternoon (Day 30). Seed of common carp are available in January-March, silver carp in February-August, rohu and mrigal in April-July, catla in May-July, grass carp in May-August, and silver barb in March-May.

Before the larvae or fry are released into

A 15-min video program on **Breeding carps for the farm** is available from SEAFDEC/AQD. Old price: P450 US\$40
New price: P200 US\$15

See page 16 for the address.

the nursery, it is important that the temperature inside the transport bag is the same as that of pond water. Place the unopened bags in the pond for 10-15 min. Open slowly and introduce small quantities of pond water to equalize the temperature. The fry are then allowed to swim into the pond.

Feeding

It is often difficult to maintain a high level of natural food for growing fry and supplementary feeds become necessary (Day 31). A mixture of finely powdered oil cake (soya beans, mustard, etc.), rice or wheat bran, and fish meal in the ratio of 5:4:1 can be supplied to fry daily.

Care of fry or fingerlings

Check the pond daily and see if there is an excess of green algae, then stop application of supplementary feeds. Increase feed if fish growth is not good. Remove frogs, snakes, and other predators from the pond.

Harvest and transport

Harvest the fry or fingerlings with a net either in the morning or late afternoon and keep them in enclosures (*hapa*) or cistern at least 3-4 h before transport (Day 60).

It is important that fingerlings are conditioned before transport. They must have time to empty their guts before being packed in high densities, so that the transport water is not polluted by excreta. Clean water from a well should be used for conditioning the fingerlings.

Transport the fry or fingerlings in oxygenated plastic bags. About 5 liters of water and 15 liters of oxygen is placed in each bag of 20 liters capacity. Density of fish (30- mm size) during transport:

Species	Fry per liter
Rohu	50
Bighead carp	50
Catla	33
Silver carp	60

Source: International Institute for Rural Reconstruction and International Center for Living and Aquatic Resources Management. 1992. *Farmer-proven integrated agriculture-aquaculture: an information kit*.

Boom or bust indices of the family farm

The farm budget, monthly cash flow, and other economic considerations are important to the family business. Here is how the farm's economic potential and performance are analyzed:

The farm budget

First, make a **cost sheet**

- List the things that are required for you to do business.
- Write down how much is needed, the price, and the amount paid.
- Add all amounts paid to find out the total costs.

Second, make an **income sheet**

- List all the products from the business that can be sold.
- Write down how much is sold, at what price, and the amount received.
- Add all amounts received to find out the total income.

Third, work out your **balance or profit sheet**

- Write down the total income received from the business.
- Write down the total costs that were required in doing the business.
- Subtract the total amount paid from the total amount received from the sales of the business.

The monthly cash flow

First, work out your **cash outflow**

- Note down the activities of the business that required money. Write down the costs involved.
- Record on the calendar the activities that needed money and the amounts paid during each month.
- Add all money required to do business each month to get the total monthly cash outflow.

Second, work out your **cash inflows**

- Note down the products sold and the money