

Fry Production: Nursing Spawn

'Spawn' is the name for the young fish about three days old that are available from hatcheries. Sometimes these young fish are also called hatchlings. The spawn of catla, rohu and mrigal is about 6-8 mm long. At this stage, the 'yolk sac' is absorbed, the mouth opened and the fins fully developed. Spawn are reared intensively, first to the 'fry' size and then to the 'fingerling' size. All the three stages are marketed and are collectively called 'fish seed'.



Spawn - that's me - surrounded by food!

It is best to stock ponds and tanks with 'fingerlings' - fish from 100-150 mm long. It is more common to find 'fry' which are not yet that big, but stocking fry straight into a pond often results in low survival.



I am fry of catla. Don't put me in the big pond yet.

It is best to rear spawn in a small, shallow, seasonal pond, known as a nursery pond. A nursery pond is often between 5 and 10 decimals (0.02-0.04 ha in size) and 1 to 1.5 m deep. These small ponds:

- are well-oxygenated
- are easy to sample and harvest
- are easy to fertilize and disinfect
- need little water for draining and refilling



Remember:

- Plan carefully before you start.
- Raise the spawn intensively before stocking it in a pond.
- Spawn like to be reared in a small, shallow, safe, nursery pond.

The spawn has a small mouth and feeds on tiny swimming animals called zooplankton which it can easily digest.

Fertilizing a pond provides a rich crop of zooplankton such as rotifers. This is the best food for the growth and survival of spawn of common carp, catla, rohu and mrigal.

Management of nursery ponds comprises three phases, all of which need considerable attention:

- Before stocking the spawn
- Stocking the spawn
- After stocking the spawn



I'm a rotifer.


We rotifers are so small you wouldn't even see us.

Actually, I'm a daphnia! I'm too big for spawn food.

Before stocking the spawn

There are four steps to preparing a nursery pond.

Remove the weeds



If I take the weeds out of the nursery pond, I will get a good harvest.


The pond should be weed-free

The nursery should not have any kind of plants at the bottom or on the sides up to the water line. This is because these plants:

- provide a breeding ground for predatory insects
- use up pond nutrients
- shelter predators (that prey on the spawn) and competitors for food
- compete for space and oxygen
- obstruct the movements of spawn/fry
- and, reduce the harvest

You might need some extra help to make sure your nursery pond is absolutely free of weeds.

Remove the predators



Whether my pond is perennial or seasonal, I need to get rid of predatory fish.


The pond should be free from predators/weed fishes

Predators and weed fish are always found in a perennial pond, that's why a seasonal pond can be better. However, there is no guarantee that a seasonal pond will be free from predatory fish.

Many predatory fish can easily get into the pond during the rainy season. If predatory fish are present, they must be removed.

For a 5 decimal (0.02-ha) nursery pond which is 1 m deep, use 7 kg of good quality bleaching powder to kill all the fishes. Another way is to apply 2 kg of urea 18-24 hours before applying the bleaching powder, if you do this, you will only need half the bleaching powder (3.5 kg).

Remove the insects



I have to get rid of the insects because they will eat the spawn.

I want to stock the pond on Monday morning, so I should spray the pond on Sunday night. I hope the weather isn't windy.

The pond should be made free of aquatic insects

Insects can fly from one pond to another. They can also live in nurseries where they multiply rapidly. Insects eat fish spawn. They also compete with the spawn for food. Insects must be controlled and their population reduced to the minimum.

Twelve hours before stocking the spawn, make a mixture of washing soap, vegetable oil and lukewarm water. (Use 300 g of soap and 1 liter of oil for a 5 decimal nursery pond.) Spray this on the surface of the pond in the evening when it is not windy. The entire surface of the pond must be carefully covered.

The spawn can be stocked the next morning before the temperature of the pond water goes up.

Now there is one more step.

Manure the pond

I want to put spawn into my pond in two weeks time, so I will start fertilizing my pond now.



Children, please go and collect some cow dung and poultry manure to put in the pond so that our fish will be big and healthy.

Stocking the spawn

Spawn is normally packed in plastic bags and transported with water and oxygen (from a cylinder). The bag is then sealed.

When you are releasing the spawn into the nursery pond, let some pond water slowly mix with the water in the bag. You don't want the water temperature to change too quickly.

Let the spawn wriggle out by itself rather than being dropped into the water.



We usually stock no more than 50 lakh spawn per ha, so we would stock 1 lakh in a 5 decimal nursery pond.

If you can get the spawn of the three Indian Major Carp species separately, it is better to stock a single species in a pond. When these are harvested, as fry of catla, rohu and mrigal they can be mixed in the proper proportions for rearing to fingerling size.

After stocking the spawn

The spawn eats up the plankton and we need to keep adding manure to the pond to keep the amount of plankton high.

Add small doses of manure (25 kg of cow dung and 15 kg of poultry manure) every five days after stocking or when the water starts becoming clear. Fermented manure is good as it uses up less oxygen. You can also use biogas slurry instead of manure.



The pond should be rich in fish food organisms

Normally, there are small amounts of fish food in a pond, but these increase quickly when we add manures and fertilizers.

Manures fertilize the pond slowly, so these are not so good if you need to stock the pond quickly.

Nutrients from manure get locked up in the acid soils, which are common in Western Orissa. You can test if your soil is acid by measuring something called pH. If the pH is less than 7 you can add 'lime'. Start with about 5 kg for a 5 decimal nursery (250 kg/ha) then test again after 3-4 days to see if it has come up to 7.

Cow dung takes longer to break down than poultry manure. Using a mixture of 100 kg cow dung and 50 kg poultry manure is a cheap and effective. The color of pond water should turn brown and have a lot of zooplankton in about two weeks. You can then stock the spawn.

To test whether the pond has enough plankton put your arm at an angle of 45° into the water up to your elbow. If you can still see your fist, the pond is not yet ready, but if your fist is no longer visible, spawn can be stocked.

The spawn will grow well if you give them some extra food. Give finely powdered and sieved rice bran and groundnut oilcake in equal proportions by weight.

Give 100 g/day in a 5 decimal nursery for the first 5 days, followed by 200 g/day from the 6th to the 10th day and 300 g/day for the next five days.

Half the feed should be given in the morning and half in the evening. Just broadcast the feed from the dyke. Make sure that it does not get blown away by the wind.



After 15 days, the fry grow to about 25 mm. You can harvest them now using a drag-net. Then you can either sell them, or rear them to fingerling size in a larger pond. Do not feed the fry on the day before they are harvested. Harvest them in the early morning, then condition them in a hapa for about two hours before you pack them.

If you rear the spawn carefully, maybe as many as 60% will survive to the fry stage.

The same nursery can be used for rearing a second crop of spawn. Stock the second crop three days after harvesting the first crop. Make sure that you add fertilizer and control the aquatic insects before you stock. You can produce at least four crops of fry in a nursery in two months during the breeding season if the spawn is available from the hatcheries.

Useful Contacts

Other Better-Practice Guidelines

There are many more Better-Practice Guidelines in this series.

You can get more copies of this and other Better-Practice Guidelines from your local One-stop Aqua Shop, STREAM India Communications Hub, from the STREAM Regional Office or from the STREAM Website.

www.streaminitiative.org

We would like your feedback about these Better-Practice Guidelines. You can let us know by phoning, emailing or writing to the Communications Hub Manager at your STREAM Country Office.

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