



QUALITY CARP SEED PRODUCTION

Aquaculture of carps is extensively practiced in India. They comprise of rohu, *Labeo rohita*; catla, *Catla catla*; mrigal, *Cirrhinus mrigala*; calbasu, *Labeocalbasu*; grass carp, *Ctenopharyngodon idella*; silver carp, *Hypophthalmichthys molitrix*. First successful induced spawning of these carps was possible in the year 1957 at Cuttack, Odisha by Dr. H.L. Chaudhary and Dr. K.H. Alikunhi. This led to a techno-economic shift in the aquaculture scenario of the country through production of carp seed in various parts of the country. Presently, more than 90% of the carp seed is produced through induced spawning in hatcheries. The quality of the seed is a critical factor for successful aquaculture. Hence, for the production of good quality of carp seed, few important points are to be considered.

Broodstock Care

For production of quality carp seed, healthy brood fish (male and female) of more than 2 years are required. Proper care of brood fish is to be taken throughout the year.

Brood Parameters

Age	: Minimum 2 years or more
Source	: Name of hatchery or Farm and year of Procurement
Health	: Must be healthy and the pond should be free from <i>Argulus</i> parasite
Size	: IMC-1.5-4 Kg, Chinese carps- 2-5 Kg
Male/Female ratio	: 1:1

Optimal Brood Pond Water Parameters

Dissolved Oxygen: 3-8 ppm; Total Alkalinity: 80-150 ppm; Ammonia: 0.5-1.5 ppm; Nitrate: 0.02-0.05 ppm; Nitrite (NO_2N): 0.002-0.02 ppm; Hardness: 60-120 ppm; pH: 7.5-8.5; Carbon dioxide: trace- < 8 ppm; Plankton density: >2ml/50-liter water

Pond Fertilization

Basal green manure: 3-5 ton/ha at a water depth of 30-40 cm and exposed to sunlight for 4-5 days, after decomposition, pond is filled with water. Or raw cow dung @ 5-8 tonnes, single super phosphate 100-250 kg, urea 75-100 kg and murate of potash 50 kg per hectare per year can be applied. The initial dose is one fourth of the total and the rest applied in split doses. Lime @ 200 kg/ha is applied if pH of water is in between 6.5- 7.5.

Application of Lime

Generally, for brood fish pH of water should be maintained at 7.5-8.5 and alkalinity 80-150 ppm, but if the pH is less than 7 and alkalinity is less than 80 ppm then 200kg of lime/ha must applied in the pond. At the beginning, the lime solution is prepared in aluminum or earthen pots and uniformly spread all over the pond.

Brood fish collection and Record Keeping

Collection of healthy fish is the first requirement for quality seed production. Source, age of fish, cultured or wild brood fish and weight of parent of brood fish are to be recorded at the time of collection. To maintain the quality of brood stock different records are to be maintained in hatchery. Separate registers should be maintained for brood fish, induced breeding, seed production and feed application etc.

Transportation of Brood Fish

- 1) For the transportation of matured male and female brood from the farm pond to hatchery, bags made up of canvas are to be used. This is called "fish stretcher" or hammock.
- 2) For long distance transportation of brood fish, cold environment such as morning or evening time is suitable.
- 3) For long distance transportation anaesthetic agent MS222 or 2-Phenoxy ethanol (about 2%) are to be used to avoid transportation stress and aerator or oxygen cylinders may be used to increase dissolved oxygen in water.

Management of Water in Brood Fish Pond

For more and early maturity of brood fish water exchange to be done at regular interval of 15-20 days. Apart from this to increase dissolve oxygen content of the water, use of aerator or water pump is also necessary.

Brood Fish Diet

To improve the breeding capability of the fish, a balanced diet is required. Brood fish are given both natural and supplementary diet comprising groundnut oil cake (48%), soybean oil cake (40%), rice bran (5%), fish meal (5%), calcium dibasic phosphate (1.5%), salt (0.3%) and vitamin mixture (0.1%). CIFABROOD is a specially formulated broodstock diet developed at ICAR-CIFA contains 31% protein is useful in getting more and early maturity in brood fish.

Management of Hatchery for Quality Seed

- 1) Male and female fish should be in equal ratio of 1:1.
- 2) Hormone injection should be given near the intraperitoneal (space between stomach and outer muscle)
- 3) For better availability of oxygen to the brood fish before and after injection, fish is to be kept in a water flow system.
- 4) A single brood fish should be used for 3 years for breeding purpose after maturation, then new fish >2 years should be used.
- 5) Care has to be taken so that no exchange of brood fish or fingerling is done for 5-10 years from the same source from where new brood fish were collected.
- 6) Cryopreserved milt is used to improve the quality of seed. If it is not available, then short term preserved milt (10-12h) of carps may be used.
- 7) In no case mixed spawning practice using random male from one species and female from other species or vice versa using catla, rohu, mrigal or silver carp and bighead carp should be done.
- 8) Different age male and female brood (male 3 years and female 2 year) yield good quality seed.
- 9) By rearing fingerlings produced from carps that spawned on different days will increase the effective breeding population and result in good quality seed.
- 10) After 5h of injection, water flow is to be maintained in tank and wastage is to be prevented.
- 11) To get good quality seed collect brood fish from brood banks located in your area or NFFBB located at Kausalyaganga, Odisha.

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