J Krishi Vigyan 2020 (Special Issue) : 248-252 DOI : 10.5958/2349-4433.2020.00001.X

Production for Fish Fingerling, Advanced Fish Fingerling and Yearlings in Kamrup District of Assam

Parag Saikia[1], Kapil Deb Nath[2*] and Dhirendra Nath Kalita[1]

[1]Krishi Vigyan Kendra, Assam Agricultural University, Kamrup-781017, Assam
[2]Krishi Vigyan Kendra, Assam Agricultural University, Udalguri-784509, Assam

ABSTRACT

The study was carried out to assess the economics of production of fish fingerling, advanced fingerling and yearling by raising fish spawn for three successive years. The investigation was based on the data collected from 4 villages of Kamrup District, Assam namely Manikpur, Rajkhowapara (Bezera), Kukurmara, and Bichennella (Rangia) which is geographically located between $25^0$46' and $26^0$49' North latitudes and between $90^0$48' and $91^0$50'' East longitudes. The study concluded that the fish seed rearing and farming was profitable venture for the locality. Since the input costs and labor costs were increasing significantly, one must know the availability resources, capital and the projected profit before starting of the fish seed rearing practice. One way to produce early season advanced fingerlings was to grow them in perennial ponds and store them at high density with minimal feeding for the coming year. When such "stunted fingerlings" were stocked into ponds with good feed they grow fast and can be marketed in about 6-8 m.

Key Words: Advanced fingerling, fingerling, perennial, seed raising, yearling.

INTRODUCTION

Seed nursing is a very important and economic venture, farmers were able to make good amount of profit in a short period of time, that is why seed nursing activity was gaining attention by many fish farmers (Bisht *et al*, 2013). Lack of quality fish seed of proper size at proper time is major constrains for the fisheries development in the Kamrup district of Assam. Non availability of fish feed ingredient, pH of the soil, slow growth rate of cultured fish, low temperature, destruction of fishing and feeding ground, fishing of juveniles and adults, exploitation of market intermediaries are adversely affecting the fisheries development in the district.

Beel fisheries of the district affected due to heavy weed infestation, siltation, illegal preoccupation, destruction of breeding ground, enclosure at connecting channel to Mother River. Lack of awareness about scientific fish farming among the farmers of the district is another important problem. Besides, recurrent flood situation of the district hinders fish farming activities. Seed nursing can ultimately solve the problem of seed availability in market and leads to increase the overall fish production. Fish seed production includes egg to spawn production for 3 d, spawn to fry nursing for 15-20 d, fry to fingerling rearing for 60-90 d and fingerling to yearling rearing for 8-9 m. Thus, the carp seed may be categorized at its final size into spawn (6-8 mm size), fry (20-25 mm size), fingerlings (100-150 mm size) and yearlings (100-200 g weight) (Radheyshyam, 2010). Keeping this problem in view, Krishi Vigyan Kendra, Kamrup has found these four villages after preliminary survey for conducting the FLD on round the year availability of fish fingerlings, advanced fingerlings and yearlings by raising of fish spawn by considering the availability of nursery and rearing ponds.

When farmers fail to sell their fingerlings and they continue to rear them up to Feb-March of next year. Before monsoon, when ponds are prepared for next fry rearing crops, farmers harvest stunted

*Corresponding Author's Email: kapildebnath88@gmail.com

fish, with the increased awareness of yearling's significance as stocking materials, it is being sold at pond site for grow out fish culture. Fish farmers produce yearlings and/or stunted fingerlings with improved management on commercial scale. In this, the fingerlings stocked in well prepared ponds at high density July-August after the sale of their primary stock as fish fry and fingerlings. Yearlings are also reared by stocking appropriate carp fingerlings along with residual stock of fingerlings. During culture period ponds are fertilized monthly once. Fingerlings are fed with the mixture of mustard oil cake and rice bran in the ratio of 1:1 by weight @ 1-2 per cent of fish biomass weight. Complete harvesting of yearlings is done by repeated netting from Feb-April. Adopting this management, the farmers can earn a handsome amount without much effort.

MATERIALS AND METHODS

The study was carried out during the years 2016-17, 2017-18 and 2018-19. The experiment was carried out in Manikpur, Rajkhowapara (Bezera), Kukurmara, and Bichennella (Rangia) villages of Kamrup District, Assam geographically located between $25^0$46' and $26^0$49' North latitudes and between $90^0$48' and $91^0$50' East longitudes. The bezera and Rangia area of Kamrup district is rural hub of water resources being immense potentiality for fish production. But farmers are not getting optimum production due to non-availability of fingerlings, fish carried over seed or yearlings of proper size at proper time. During the year 2016-17, twenty five (25) numbers of fisher acquired training on rearing of fish seed in backyard pond for income generation. At that time, 5 numbers of fishers were selected as beneficiaries for the FLD on round the year availability of fish fingerlings, advanced fingerlings and yearlings by raising of fish spawn. They were also given assistance in the form of hands on training of pond preparation, method of rearing fish fry, method of feeding to fry, and their management. Each beneficiaries was provided 1 lakh spawn along with 40 kg fish feed and 9 kg of lime for three successive years.

In the study, assessed 25 numbers of pond covering 3.5 ha area with an average 14000 m^2 pond area. The ponds were prepared according to standard management practices. Stocking was done at 500/m2 of fish spawn (catla /rohu /common carp /grass carp /silver carp/ mrigala) and reared initially for about 50 d and collected the data of fixed cost and operational cost for the seed rearing.

Prevailing culture practices

The size of ponds used by farmers was generally small in size with some farmers having ponds even with an area of 0.13 ha – 0.39 ha. Some farmers had more than one pond and total area of such farmers exceeded to nearly one ha in size.

Pond preparation and stocking

Before stocking of spawn ponds were netted several times. Endosulfan @ 100 g/0.13ha was applied to kill the weed fishes. After three days of using Endoulfan, liming was done in the pond @ 48 kg/0.13ha of water area and after 7 d of liming; Potash (KMNO4) @ 250g/0.13ha of water area was applied. Potash was mainly used to reduce the effect of poison. Then after 2 d, 10 pieces of fingerling was kept into a hapa fixed in the pond to see the water condition of the pond i.e. fishes were dying or not in the pond water. Then after 2 d, spawn was stocked @ 1.5 lakh/0.13 ha of water area.

Post stocking management

Up to 3d of stocking feeding to the spawn was restricted and after 3d, liquid feed like Ostovet which was available in the local market was fed. After 5d, feeding was done with MOC (Mustard Oil cake) by soaking it in water for 3 d into a tank. After 15 d of stocking of spawn, it was then transferred into another pond to get a better growth.

RESULTS AND DISCUSSION

The study revealed that, fixed cost is about for Rs. 20,000/ha for renovated pond and operational

Table 1. Economics of fish seed rearing.

Particular	Quantity	Rate	Amount
Fixed cost			
Pond repairing			10,000
Pipeline and sluice gate construction			5,000
net			5,000
Total			20,000
Operational cost			
Deweeding, bund compaction	25 man d	250/person	6250
Lime	200 kg/ha	16/- per kg	3200
Fish spawn (Catla/rohu/common carp/grass carp/mrigala)	Stocking @ 500/m^2 = 50 lakh	1000/lakh	5000
Feed (Rice bran and Mustard oil cake)	1875 kg Mustard oil cake & 1500 kg Rice Bran	Rs 25/- per kg MOC & Rs 20/- per kg rice bran	76,875
Labour for feeding other maintenance	50 man days	Rs. 250/person	12,500
Raw cow dung	4 t/ha in 4 split doses	Ru. 1 per kg	4000
Harvesting expanses	12 man days	250/person	3000
Transportation of inputs			15000
Watch and ward, Miscellaneous			10,000
Total			1,80,825
Total cost (fixed + operational)			2,00,825
Production/ha (In 50 days)	**Production**	**Unit cost (Rs.)**	**Gross Revenue(Rs.)**
Catla @ 30% survival	15,00,000	0.50	7,50,000
Rohu @ 40% survival	20,00,000	0.40	8,00,000
Common Carp @ 50% survival	25,00,000	0.25	6,25,000
Grass carp @ 30% survival	15,00,000	0.60	9,00,000
Mrigala @ 40% survival	20,00,000	0.35	7,00,000
Silver carp @ 30% survival	15,00,000	0.35	5,25,000
Profit by Species	**Net return(Rs.)**	**BCR**	**Return on investment**
Catla	5,49,175.	3.73	2.73
Rohu	5,99,175	3.98	2.98
Common Carp	4,24,175	3.11	2.11
Grass Carp	6,99,175	4.48	3.48
Mrigala	4,99,175	3.48	2.48
Silver carp	3,24,175	2.61	1.61

cost is about Rs. 2,00,825/ha required for the 50 d seed rearing period (Table 1). Net profit of fish seed rearing among the species reared (catla, rohu, common carp and grass carp) were highest in grass carp following by others. The BC ratio of catla is 3.73, rohu is 3.98, common carp 3.11 and grass carp is 4.48. The return on investment is high in grass carp (3.48) followed by rohu (2.98), catla (2.73) and mrigala (2.48). According to CIFA, net income of about 46,000.00/ha/crop can be obtained by carp seed rearing practice. Chowdhury *et al* (2019) also reported a net income of Rs. 1,42,500/- having BCR 3.11 through production of fish fingerling from 0.4 ha of water area.

Production of advanced fingerlings and yearlings

Application of compensatory growth phenomenon by using stunted carp fingerling has been proved to have greater potential in increasing fish production. However to produce stunted fish, advance fry or fingerling are stocked at higher densities with suboptimal feeding and fertilization, rendering the fish to stressful conditions. These stressors cause many changes in physiological aspects of fish including the defense system. The seed should be stock in early morning or evening time because during this time temperature is low. Advanced fries are stock @50,000-70,000 fry/ha.
In all the locations under study congenial water temperature for fish growth was observed from August to October last. Average fish yearlings yield recorded in demonstration units was 38.1 q/ha, 33.8 q/ha and 37.8 q/ha during 2016-17, 2017-18 and 2018-19, respectively (Table 2).

Advanced fingerlings or yearlings are miniature adults- a high value product and is great demand. They sell like hot cakes either by weight (Rs.150-250/ kg) of by number (Rs. 15-30/ piece). These are harvested and conditioned and often delivered by the producer's own workers. Fish transportation in large hundies is a skill traditional practice. Yearlings can also be transported in open public carrier van lined with polyethene sheet with skill manual oxygen supply or in plastic tank with a oxygen supply or in tied plastic bags with 1/3 water and 2/3 oxygen.

CONCLUSION

Seed nursing doesn't require large water bodies; they can be culture in small water bodies also. As a result, culturing fish seed can provide a better option for farmers because they don't have to spend the whole year to get the harvest and in a single year they can do three to four harvesting of fish seed and make money in a very short period of time (which is the most common problem of the farmers). Seed nursing can ultimately solve the problem of seed availability in market and leads to increase the overall fish production. Based on the results of these experiments, it can be concluded that though the fish seed rearing and farming is profitable. Since the input costs and labor costs are increasing significantly, one must know the availability resources, capital and the projected profit before starting of the fish seed rearing venture. One way to produce early season advanced fingerlings is to grow them in perennial ponds and store them at high density with minimal feeding for the coming

Table 2. Average yield (q/ha) of yearlings.

Year	Rajkhowapara (no. in lakh)	Manikpur (no. in lakh)	Bichenella (no. in lakh)	Kukurmara (no. in lakh)	Av. Yield (q/ha)
2016-17	0.8	0.48	2.24	4.8	38.1
2017-18	0.65	0.51	2.02	3.7	33.8
2018-19	0.85	0.56	2.15	4.1	37.8

(Depending upon the species 20-40 nos. fish weight 1 kg at the time of yearling harvested)

year. When such "stunted fingerlings" are stocked into ponds with good feed they grow fast and can be marketed in about 6-8 months.

REFERENCES

Bisht A, Anand S, Bhadula S and Pal D K (2013). Fish seed production and hatchery management: A Review. *New York Sci J* **6**(4): 42-48.

Radheyshyam (2010). Carp seed production in india at rural front in Orissa, India. *Aquac Asia Mag* **15(2)**: 20-24.

Chowdhury P, Rahman A, Nath K D, Saikia N, Bora D, Saikia S and Sarkar L (2019). Round the year availability of Fish Fingerlings, Advanced Fingerlings and Yearlings by raising of fish fry in Cachar district of Assam. *Poultry Valley* **3(10)**: 24.

Received on 22/06/2020 *Accepted on 23/08/2020*