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EFFECT OF CERTAIN FERTILIZERS, FEEDS AND COBALT CHLORIDE ON THE PRODUCTION AND SURVIVAL OF YOUNG ONES OF THE COMMON CARP *CYPRINUS CARPIO* L.

K. P. SHARMA & S. D. KULSHRESHTHA

Department of Fisheries, College of Agriculture, Basrah University and Post -graduate Department of Zoology, Government College, Kota, Rajasthan, India.

Application of suitable fertilizers and feeds is of vital importance in enhancing production and survival of fish in ponds . Some important works in this regard are those of Schaeperclaus (1933), Hora (1943) , Alikunhi *et al.* (1955) Alikunhi (1957), Das and Krishnamurthy (1961), Hora and Pillay (1962),Report of the Fish Seed Committee Government of India (Anon 1966) , Lakshmanan *et al.* (1968) , Rabanal (1968) , Swingle (1968) , Sen (1972) and Ghosh (1972) have stressed the role of cobalt in augmenting production and survival of fish . A perusal of the literature reveals that a large number of authors have devoted their attention to the culture of fry and fingerlings in field conditions with emphasis on nursery managment. Inspite of this the per hectare (ha) production of the Table – sized fish is alarmingly low in India. We have observed that common carp (*Cyprinus carpio* L.) although breeds in ponds in the usual course, its growth and survival remained poor. Very heavy mortality was observed in the spawn and fry stages resulting in low production. Therefore, the authors have attempted to try out certain fertilizers and feeds for enhancing production and survival of the common carp young ones.

MATERIALS AND METHODS

Under the present study four–day old mixed hatchlings of common carp (*Cyprinus carpio communis* L. and *Cyprinus carpio specularis* L.)of similar

parentage were reared for 46 days at the Kaithoon Fish Farm, Kota, Rajasthan, India in eight nursery ponds each with an area of 0.028 ha with almost identical conditions initially.

For convenience in study and comparison the nursery ponds were divided into four groups: Group I included pond nos. 1 and 2; II, 3 and 4; III, 5 and 6 and IV, 7 and 8.

Group I was fertilized with ammonium sulphate while those of groups II and III with deep litter fertilizer from poultry a week ahead of the introduction of common carp hatchlings. The young ones in all the nursery ponds were fed daily on a mixture of rice bran and ground nut oil cake in the ratio of 1:1 by weight. Ponds of group II and IV were also provided with cobalt chloride daily (Table 1).

Table 1

Average quantity of feed, fertilizers and cobalt chloride supplied in each group in kg

Group	Rice bran and ground nut oil cake	Cobalt chloride	Ammonium sulphate	Deep litter fertilizer
I	48.0	nil	2.0	nil
II	32.0	0.256	nil	500
III	40.0	nil	nil	500
IV	50.0	0.256	nil	nil

The feed in ponds was put in plastic tubs about one foot deep below the level of water at suitable places. Fresh ration was supplied only when the previous quantity was found to be consumed. The cobalt chloride was first made into solution with water and sprinkled in the various ponds.

Records of air, water temperatures and oxygen contents were kept weekly.

RESULTS

In nursery ponds, highest production by weight was achieved in group III (*c.* 535 kg/ha), followed by group II (*c.* 362 kg/ha). Production in group IV came next (*c.* 258 kg/ha) closely followed by group I (*c.* 248 kg/ha) as given in Table 2.

Table 2

Number of hatchlings stocked, percentage survival and rate of production of common carp

Group	Pond	Hatchling stocked	Total no. harvested	Survival %	Production (kg)		
					Total production	Production per ha.	Average production per ha
I	1	12000	2000	16.60	6.96	248.50	248
	2	12000	1945	16.20	6.90	247.90	
II	3	12000	2090	17.40	10.00	357.14	362
	4	12000	2150	17.90	10.30	367.80	
III	5	12000	1404	11.70	15.02	536.40	535
	6	12000	1395	11.62	14.92	532.80	
IV	7	12000	1906	15.88	7.24	258.5	258
	8	12000	1900	15.84	7.21	257.5	

The lowest percentage of survival (11.6) has accompanied with the highest production (in group III). The data given in Table II clearly indicate a steady fall in the survival rate with the increase in production rate, though the same does not hold true for group II where survival percentage was 17.6.

DISCUSSION

It is reported that cobalt chloride is a growth– promoting substance and is used as an additive to the feed of developing fry. It raised the survival rate also to a large extent. Sen (1972) reported very satisfactory results reg arding survival and growth of Indian major carp fry by the use of cobalt chloride. Ghosh (1972) also found that the growth and survival rates of *Mugil parsia* increased with cobalt chloride. Since both these reports were in abstract form further details could not be ascertained.

However in our experiments, although, the total production per ha was quite encouraging the survival percentage remained very poor. This was rather curious in view of the role of cobalt chloride in enhancing survival as advocated by certain workers (*op. cit.*). However, poor survival was due to a variety of reasons. Cannibalism was observed particularly in the younger stages of common carp. This phenomenon was induced as a result of the heterogenous growth of the developing young ones. Wide fluctuations in temperature were also largely responsible for mass mortality.

Group III showed the highest production. This is obviously due to the fact that deep litter fertilizer was employed in the initial preparation of these ponds. This fertilizer is a by–product from poultry and is one of the most valuable organic fertilizers available (McArdle and Panda 1965, Anon 1961). Nandy *et al.* (1972) reported a sustained growth of zooplankters by the application of poultry droppings along with Mahua (*Madhuca latifolia*) oil cake, cowdung and urea in the ratio of 1 :6:3 which at 1000 ppm proved useful.

When group II was compared with group III we found that in both of them an equal amount of deep litter fertilizer was added. But in addition to this,