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EFFICACY OF FERTILIZER ON THE GROWTH RATE OF CULTURABLE CARPS UNDER INTENSIVE CULTURE CONDITIONS

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An experinenr to assess the efficacy of fertilizer (urea) on the growth rate of culturable carps viz. *Labeo rohita, Catla catla* and *Cirrhina mrigala* was conducted in the control and treated ponds. Average weight gains in control pond were 231. 277 and 319 g for three tish species respectively, while the weight gained in treated pond was 260, 331 and 362 g respectively. Net fish production in control and treated ponds was 43.64 and 61.97 kg/pond/year. Treated pond thus showed 1.42 times higher net fish production than the control pond.

Key words: Culturahle carps. efficacy of fertilizer. growth rate

INTRODUCTION

Of all the major issues. food supply with quality food protein is or immense irnponance for the above mentioned fish species (Alhinate *et al*.. 19~3). A fish yield of 1400 kg/ha/year by the application of N:P:K@20:20:5 resulted in 814:35 kg higher yield as compared to the unfertilizl:d ponds (Sheri *et at*.. 19S6b). The use of fertilizer urea enhanced the growth rate of major, common and some Chinese carps under *composite* fish culture system and led to the maximum net fish yield of 7290.23 kg/ha/year (Mahbooh, 1992). The present study was aimed at determining the efficacy of an inorganic fertilizer (urea) on the grworh rate of culturable carps such as *Labeo rohita*, *Catla catla* and *Cirrhina mrigala*, under intensive culture system.

MATERIALS AND METHODS

An experiment to study the efficacy of fertilizer on the growth rate of culturable carps under intensive Culture conditions was conducted in two earthen ponds (0.048 ha) at the Fisheries Research Farm, University of Agriculture. Faisalabad. Of the two ponds, one was designated as the control (without additives) and the other as treated. For disinfection, both ponds were limed *with* calcium oxide by *dusting* method. Both control and treated ponds were tilled with Water upto 1.5 m and this level was maitnained throughout the study period. Both ponds were stocked with 50 *Labeo rohita*, 37 *Catla catla* and 13 *Cirrhina mrigala.* At stocking the wet body weights of the three fish species were also recorded. The fertilization of treated pond was done on the basis of equivalence of nitrogen derived from the inorganic fertilizer (urea). Nitrogen fertilizers were calculated on the basis of nitrogen equivalence of an artificial feed with 4% wet body weight of major carps per day. Cultured stock from control as well as treated ponds was sampled every fortnight to detect any change in weight *gain* of three fish species. After making necessary observations. all fishes were released back into their respective ponds.

RESUL TS AND DISCUSSION

Average Growth Rate: All fishes used in this study showed an

Table I. Fortniululy increase in bady weight (g) of culturable carps in control and treated ponds

Labeo rohita		*Cirrhina mrigala*		*Catla catla*	
Control	Treated	Control	Treated	Control	Treated
152.0n	152.00	173.00	173.00	210.00	210.00
170.20	169.10	185.00	187.10	222.20	224.00
190.00	192.30	199.00	215.50	240.70	242.10
204.50	210.00	221.30	238.00	270.70	282.30
212,50	225.50	241.80	273.00	292.70	.312.90
220.50	238,40	262.20	288.30	304.80	338.30
226.60	246.30	274.50	300.30	317.30	338.00
230.30	257.60	284.70	315.30	328.10	374.50
240.00	268.80	290.20	319.90	336.50	385.00
255.00	292.20	308.50	344.90	357.10	416.00
279.50	340.60	341,90	386.30	386,40	464.50
299,40	38J .50	387.10	438.60	421,60	520.30
328.70	410.00	441,20	501,70	466.70	583.30

Table 2. Analysis of variance of data on body weight of culturable carps in control and treated ponds

Source of variation	Degree of freedom	Sum of squares	Mean squares	F. values
Treatmelll (1')	I	923.80	923.78	56.92**
Fortnight (F)	11	10524.85	958.80	58.95**
r x F	11	459.86	41.80	2.58*
Species Ci)	2	907.20	453.60	27.95**
S x r	2	65.76	32.88	2.02NS
S x F	22	1517.31	68.97	4.24NS
Error	22	357.01	16.23	
Total	71	14755.73	2493.06	

'I' Significant: ** Highly signiticant.

evident variation with respect to their growth rate. Initial and final average weight of *Labeo rohita* in control and treated ponds was 152.328.7 g. and 152 and 41O g respectively. For *Cirrhina mrigala*, initial and final average body weights were 173.441.2 and 173 and 501.7 g. respectively. Values for *Catla catla* were 210 and 466.7 g and 210 and 583.3 g. respectively (Table I1.

A maximum increase in weights of various fish species was noted in March for control as well as treated ponds (Table I). Similarly. a minimum increase in weight of these fish species was recorded in January and February. It was evident from the analysis of variance that highly significant differences were found among the weight gains in three fish species both for control and treated ponds (Table 2). In the present experiment, maximum weight gain for the culturable caprs was recorded from the treated pond (fertilized with urea). Similar results were also obtained by Boyd (1976) who found that by the use of different ratios of N:P:K. fish production increased. An increase in weight of fishes was also recorded by the addition of single superphosphate in pond (Wood and Shedden, 1971). The best method for increase in fish production was described by Bishara (1978) i.e. by adding single superphosphate monthly at the rate of 20 kg/pond. The data of this study showed that a maximum increase in weight of fish species occurred in March, owing to the optimum environmental temperature and abundance of food in the pond. Simit.u ly, a minimum rate of grwoth was recorded in January and February due to cold temperature and the resultant scarcity of food. Increase in body weight of three culturable carps was obtained earlier by adding urea as a fertilizer (Sheri *et al.,* 1986 and Saleern, 1987).

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