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Yield performance of Jayanti Rohu in farm ponds at Chitrakoot district of Bundelkhand

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Abstract

Fish farming with the composite fish culture system with IMC is prevalent in farming community of Bundelkhand. Various environmental and production factors affecting fish productivity such as quality seed, poor feeding, and climatic stress etc. farmers were not able to get satisfactory growth of fishes. The present study deals with the growth performance of genetically improved Jayanti rohu (T-1) cultured at KVK Chitrakoot, UP and compared with traditional rohu (Labeo rohita) under mono culture system. In the present study locally available Rohu (Labeo rohita) was replaced with improved variety of Jayanti Rohu to evaluate the growth performance and production economics of the production system. Two different ponds of KVK Chitrakoot, UP was selected for the study. Advance fry of Jayanti Rohu was supplied by NFFBB Bhubneshwar. In another control fish pond (T-2) traditionally available Rohu (Labeo rohita) was cultivated. Fishes were fed with floating fish feed of different protein level and sizes as per seed requirements. Water quality parameters were tested and health monitoring was practiced by monthly netting. The culture period was from august 2018- September 2019 of 12 months. Jayanti Rohu showed 19.05 % higher growth as compared to traditionally available Rohu (Labeo rohita) at KVK pond. High market price was also observed for Jayanti rohu in local market. The income from Jayanti rohu was Rs. 119980.00 and traditional rohu was 95900.00 per ha, which is 25.11% higher in Jayanti rohu cultivated pond.

Keywords: Jayanti rohu, Growth, Yield, Income, water quality

Introduction

In Uttar Pradesh fish farming is mainly practiced in community village ponds. There are less numbers of ponds which are owned by farmers as a private pond. Most of village ponds are owned by the village management committee and leased out for 10 years by district government officials. The Uttar Pradesh possessing vast inland water resources which are used for different purposes of utilization like irrigation, drinking, community services and fish farming. These water resources are potential areas for fishery development by changing their mode of utilization as fish farming. Because of higher population growth the Demand of fish increasing day by day. The major food producing sector contributing to the National nutritional security, export and employment generations in India is Aquaculture. (Edward and Demaine, 1997) ^[1] Expressed that the fish provide good quality & high protein because it contains good number of amino acids required for good nutrition as well as it provides a lot of vitamins, minerals and iodine. The Uttar Pradesh has good fishery resources having 4.32 lakh ha total inland water bodies with 28500 Km Rivers and canals, 1.38 lakh ha reservoirs and 1.61 lakh ha ponds and tanks. (Profile of Fisheries: Uttar Pradesh) ^[2] Out of 1.61 lakh ha pond and tanks only 70000 ha is now under fish culture out of 1.46 lakh ha area suitable for fish culture. According to the 2011 census Chitrakoot district has a total area of 3216 sq km. (Mishra et al. 2007) ^[3] reported that the total fish production of the district was recorded 48015 kg per year. Therefore, estimated annual fish yield of pond of district is 1439.75 kg/ha/year. This yield is very less to the recommended fish yield of a pond i.e. for U.P. 3500kg/ha/year. Besides the vast potential of fish production resources, the state is not self-sufficient to supply fish demand of the state.

Still Uttar Pradesh has producing 6.32 lakh ton of fishes against the demand of fish in Uttar Pradesh is 15 lakh metric tonnes (15kg/ capita/ year for 54% fish eating population of the State) against the total production of 4.9 lakh metric tonnes (NFDB)⁴ Government of India and state govt. has started various policies to increase the fish production of the state from last 5 years. The temperature range for getting optimum yield from ponds should be in between 28-30°C But in U.P. the temperature remains in range only for 7 months, due to this condition fish growing period is less than coastal states. Keeping these in mind the study was conducted to evaluate the growth performance of Jayanti Rohu developed by ICAR-CIFA, Bhubaneswar in carp mono culture system & compared to existing Rohu (*Labeo rohita*). The culture of Jayanti rohu is preferred over the normal rohu due to its higher growth performance and disease resistance (Das Mahapatra, et al. 2007)^[5]. The growth performance of Jayanti rohu in monoculture system was 38.16% higher than that of normal rohu in monoculture system after the culture period of 11 months. The growth performance of Jayanti rohu in composite fish culture system was 17.72% higher than that of normal rohu in monoculture system (Sharma, 2015)^[6].

Materials and Method

The present study was conducted at KVK, Chitrakoot U.P. Two ponds having an area of 0.5 and 0.3 ha are selected for the study. The monoculture of Jayanti rohu conducted in 0.5 ha pond (T-1) and compared with monoculture of traditional rohu in pond size of 0.3ha (T-2) as control pond. Fingerlings 10.2cm of 10.50 gm Jayanti Rohu were stocked the seed supplied by NFFBB, Bhubneswar and control pond stocked with traditional rohu having average weight 8.66 gm of 8.66 cm length. The ponds were well prepared before stocking. The ponds are dried, manured with dung @5000kg/ha and liming was done @ 200 kg /ha agriculture lime. Both the ponds were stocked with stocking density of 6000 fingerling /ha. Water quality parameters such as temperature, pH, transparency, dissolved oxygen (DO), Total alkalinity and Total hardness etc. were monitored on monthly basis and maintained for better health condition of the fishes. The stocked fishes was fed with floating fish feed. The feeding rate and frequency were maintained to avoid loss of feed as well to prevent deterioration of water quality. Growth of fishes was recorded monthly in both the ponds to evaluate the growth performance of Jayanti Rohu and traditional rohu. Final harvesting was done after 12months of culture. The average body weight gain (ABGW) and the body length increment (cm) was determined monthly. The data collected were analyzed scientifically.

Results and discussion

Both the pond experimental pond (T-1) and control ponds (T-2) were stocked during the month of September. The growth performance of fishes was presented in table-1. The growth pattern was found higher in experimental pond than traditional strain cultured at same location. The result indicated that the average body weight of Jayanti rohu was 408 grams with body length of 32.5 cm in experimental pond (T-1) whereas in control pond (T-2) average body weight was 342.52 gram with the body length of 27.8 cm in 12 months culture period. The water quality parameters were also recorded monthly basis. Water quality parameters were found to be in acceptable range throughout the culture periods in 12 months of culture. All the parameters except total alkalinity

were in congenial range that is presented in table -2. The dissolved oxygen concentration in both the ponds found in permissible limit that is ranges in between 4.2 – 8.8 mg/l in experimental and 5.2 – 8.9 mg/l in control ponds. The Ph level in experimental pond found in between 8.2-9 and 8.2 - 8.9 in experimental and control ponds simultaneously during culture. Total hardness in experimental pond was found in between 145-225 mg/l and 130 – 255 mg/l in control pond whereas total alkalinity found slightly higher in both the pond that is 255 – 450 mg/l and 245 – 435 mg/l in experimental and control ponds. The water temperature remains in between 14-29 °c. The Indian major carps thrive well in the temperature range of 18.30C -37.80C (Jhingaran, V.G.1991)^[7]. The plankton productivity is found average and shows 2.33 -3.0 ml in experimental pond and 2.0 – 2.75 ml /50-liter water filtered through plankton net. Although, some fluctuations in water quality parameters were recorded during the experiment, the ranges were suitable for fish culture. The FCR of fish production shows 1.59 and 1.488 respectively in experimental and control ponds. (Bhatnagar and Devi 2013)^[8] presented the acceptable ranges of water quality parameters, the favorable ranges of different water parameters are: Dissolved Oxygen (DO) 3 -5 mg /L, pH 7-9.5, total alkalinity 50-200 mg /L, hardness 75-150 mg /L, temperature 15-35°C, turbidity 30-80 cm. India's first genetically improved rohu, Jayanti rohu was developed by Central institute of fresh water aquaculture during 1997 on the occasion of 50th year of independence of India. Its character is similar to rohu but grows faster than the normal rohu and it has 17 % higher growth than traditional rohu. The Jayanti rohu is recorded 17% more growth per generation after five generations of selective breeding (Reddy, 2003)^[9]; (Das Mahapatra et al. 2007)^[10]. The growth performance of Jayanti rohu is better than normal rohu when it is cultivated in extensive farming system in weight and survivability. The performance of the improved Jayanti rohu carp strain showed 15% higher body weight at harvest in India and 36% higher in Bangladesh (Dey et al. 2010)^[11]. The improved rohu strains are found to be more profitable than the existing traditional strains. This would increase the profitability who can afford higher price for genetically-improved brood stock (Kumar et al. 2008)^[12]. The highest weight of jayanti rohu observed 756 gm in the culture period of 12 month and traditional rohu attained highest weight of 548 gm. The farm economics showed increase in production as well as profit from ponds cultured with Jayanti Rohu. An average of 19.05 per cent weight increased in jayanti rohu over traditional rohu under monoculture system. The annual income was 25.11 % higher experienced by the trial conducted at KVK.

Conclusion

The performance of trial has shown that the improved rohu variety Jayanti Rohu was economically viable, profitable and also socially acceptable. Replacement of Jayanti Rohu under monoculture/poly-culture farming systems instead of traditional rohu strain was acceptable by farmers and advisable for adoption to increase the profitability and productivity of fish as well as enhancing the income of the fish farmers and entrepreneurs.

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Table 1: Growth performance of Jayanti rohu and traditional rohu

Variety	Av. length at Stocking (cm)	Av. Wt at stocking (Gm)	Culture period (Days)	Av. Length at Harvesting	Av. Weight at Harvesting (Gm)	Highest weight (Gm)	Yield Q/ha	FCR
Jayanti Rohu	10.2	10.5	360	33.5	408	745	8.57	1.59
Rohu	8.16	8.66	360	27.8	342.72	548	6.85	1.488

Table 2: Water Quality Parameters

Variety	Temp	Ph	Transparency	D.O.	Total alkalinity	Total Hardness	Water depth	Plankton population
Jayanti Rohu	14-29	8.2-9.0	17-41	4.2-8.8	255-450	145-225	1.25-2.45	2.33-3.0
Rohu	14-29	8.0-8.90	22-42	5.2-8.9	245-435	130-215	1.20-2.50	2.0-2.75

Table 3: Economic performance

Variety	Total Income /ha (Rs)	Total expenditure/ha (Rs)	Net Income (Rs) /ha
Jayanti Rohu	119980.00	60000.00	59980.00
Rohu	95900.00	52100.00	43800.00



Performance of Jayanti Rohu



View of Demo Pond

farmed fish, 2015, 1-20.

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