



Genetically Improved Rohu “Jayanti” for Sustainable Aquaculture Production

Selective breeding of rohu has been initiated for the first time in India by ICAR-CIFA in collaboration with Institute of Aquaculture Research (AKVAFORSK), Norway to genetically improve rohu for higher growth. Rohu (*Labeo rohita*) has been chosen as the candidate species for selective breeding as its consumer preference is very high and also it appears to grow slower than other Indian Major carps in multispecies carp culture system.

Base population for the selective breeding of rohu was initiated with from five riverine sources i.e. Ganga, Yamuna, Brahmaputra, Sutlej, Gomati and ICAR-CIFA stock was added as sixth stock. Through combined selection method selective breeding was performed. It has shown genetic gain of 18 % per generation for growth trait after nine generations of selective breeding. Improved rohu was tested in different agro-climatic regions of India i.e., Punjab, Andhra Pradesh and West Bengal. In the all the field testing centres improved rohu showed superior growth efficiency over control and local hatchery stocks. The improved rohu is popularly known as “Jayanti” as it was first released in the 50 years of India's independence.

Role of genetically improved seed

- Genetically improved seed can be reared with existing endowment of farmers and can be harvested obtaining higher yield per unit area.
- It will not affect the other indigenous species under cultivation.
- The adoption of genetically improved strains will increase fish production, enhance profitability, lower fish price, increase consumption and improve economy of fish farmer as well as nation as whole.

Salient Features of Jayanti rohu

- Substantial additive genetic variance for growth
- Negligible heterosis (hybrid vigour) for growth
- Ranking of fullsib families for growth is highly consistent in mono and poly culture practices
- Average 18% realized selection response per generation after nine generations of selective breeding
- Field trials and on-farm trials confirm the growth potential of improved rohu "Jayanti"
- At least 50 % economic gain in farmers ponds, It takes 2 month of less time to attain marketable size

- It has attractive colour to fetch better price in the market
- Disease resistant trait i.e. against Aeromoniasis was added as second trait to the breeding program

Multiplier units for entrepreneurs

- Seed can be produced by the specific multiplier units (Seed production unit) operated with technical support and supervision of ICAR-CIFA.
- The multiplier units required to maintain hatchery with minimum one spawning pool two hatching pools, 2 ha of nursery and brood rearing ponds.
- Each year multiplier unit have to receive brood seed from ICAR-CIFA and after raising to brood fish each broodstock to be used for two breeding cycles. After that they should be harvested.
- The cost of production for this species is not very high since it does not require high protein feed and can be farmed with locally made plant based feed with 25 % protein level. Jayanti rohu is feed neutral. The daily ration of feed may be given in two instalments @ 3-4% of body weight. Stocking density should be moderate i.e. 6000-7000 fingerlings/ha to obtain higher yield individually. Periodic health monitoring is also essential.
- No genetically modified organism is used in this process so any undesirable repercussions on the environment or on the biodiversity of the aquatic system can be completely ruled out
- The ultimate target groups of this project are principally farmers and small householders, but a wide range of beneficiaries are expected including scientists, aquaculturists and commercial producers.

Dissemination program

Effective dissemination mechanism is essential so that research products will reach the ultimate users. Under the dissemination program, ICAR-CIFA have disseminated improved rohu to 16 states and every year more than 20 million spawn are distributed to the various parts of country from nucleus i.e. ICAR-CIFA itself. However, Multiplier units/ hatchery managers have to maintain purity of the improved stock. As mixing of local stock many a times give bad name to the product. The same thing was also experienced in the rohu breeding program.

Selective breeding is one of the finest tools to improve genetic status of fish in a positive direction. However, it should be remembered that genetically improved varieties whether a plant, animal or fish requires particular management to get the full benefit of its extra performance and " Jayanti" rohu is not an exception to this. To realize its performance to the optimum level, management practices like proper stocking density, balance feed and health management is essential.



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