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“Development on the margin”

Interaction of Natural Food and Supplemental Feeding for Common Carp in Semi-intensively Managed Ponds in the Marginal Uplands of Son La Province, Northern Vietnam

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Abstract

In the mountainous Yen Chau district, northern Vietnam, each household of Black Thai farmers manages at least one pond contributing tremendously to the food safety and cash income of that household. Traditionally, farmers are culturing a polyculture of grass carp with 2–4 other carp species and Nile tilapia. The production is limited by low quality feed items, the threat to grass carps of an unknown disease, and high turbidity caused by uncontrolled water inflow from highly erosive upland fields. These limitations cause low regional fish production of 1.5 t fish ha⁻¹ a⁻¹. To increase fish production, it was suggested to culture common carp as the main species in polyculture using locally available feed resources as supplemental feed. Also, it was investigated whether supplemental feeding for common carp is as efficient under traditional flow-through management as under semi-intensive management with controlled water flow-through.

Net cage trials were performed in two ponds; one managed as a flow-through system with organic fertilisation, another with no water inflow and supplemental inorganic fertilisation. Four iso-nitrogenous feeds based on locally available high-protein ingredients (commercial pig feed, commercial fish feed, fish meal, tofu residue, soybean meal and corn meal) were used as supplemental feed at a rate of 3% of the common carp's body mass per day. In triplicates, net cages (2 × 2 × 2 m) were stocked with five common carp fingerlings each. Water quality parameters and abundances of natural feed resources were monitored. Gut content analyses were performed as a measure of consumed natural food. Fish carcasses were analysed chemically to determine the nutritional status of the fish.

Results show, that the first limiting factor for good growth rates in common carp is the amount of available feed energy. Since availability of natural food was low in the flow-through pond growth of the common carp was low. By stopping the water flow and increasing fertilisation, the natural food availability increased and resulted in higher growth rates. All tested feeds showed different effects in growth rates caused by the quality of protein ingredients. An introduction of supplemental feeding practice into this region must go along with an adequate pond management.

Keywords: Common carp, semi-intensive aquaculture, supplemental feeding