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## MULTIDIMENSIONAL MODELS OF SURVIVAL OF FISH FINGERLINGS AND FORMATION OF FISH PRODUCTIVITY OF MATURING PONDS

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Multifactor modeling allows determining the optimal parameters of intensification methods of stimulating the natural food supply in order to increase the bio-productivity of pond ecosystems.

The results of seven-year studies of the hydrobiological regime of fish ponds and the study of the influence of abiotic and biotic factors on the formation of productivity of maturing ponds are given in conditions of intensive fish breeding.

Multidimensional-multifactorial models of survival of fingerlings (%) and fish productivity (c/ha) were constructed depending on a number of factors.

The correlation model of fingerlings survival was as follows:

$$Y_x = -99.8 + 9.25X_1 - 0.139X_2 + 0.0004X_7 + 0.061X_{13} - 0.128X_{15} - 0.195X_{17} - 0.57X_{19} + 0.58X_{22} - 0.37X_{23} - 0.57X_{24}, \quad (R = 0.726, F_1 = 4.47).$$

The increase in fingerlings survival occurs with an increase the water temperature to 22.4°C ( $X_1$ ), the consumption of mixed fodder ( $X_7$ ), the increase in the zooplankton biomass ( $X_{13}$ ), and the increase in the degree of overgrowing of pond by macrophytes ( $X_{22}$ ). The decrease in fingerlings survival occurs with an increase in planting rate of carp larvae ( $X_{15}$ ), silver carp ( $X_{17}$ ) and bigmouth buffalo ( $X_{19}$ ), and also with an increase in the pond area ( $X_{24}$ ).

The correlation model of fish productivity was as follows:

$$Y_x = -4.96 + 0.96X_1 + 0.0015X_7 - 0.134X_{10} + 0.029X_{16} + 0.861X_{18} + 0.044X_{13} + 0.61X_{20} - 0.322X_{22} + 0.23324 - 10.03X_{25}, \quad (R = 0.801, F_1 = 7.05).$$

With an increase in the degree of overgrowing macrophytes ( $X_{22}$ ) to 32.6%, fish productivity decreases. The increase in the consumption of mixed fodder ( $X_7$ ), the planting rate of grass carp ( $X_{16}$ ), silver carp ( $X_{18}$ ), and the planting rate of uncharted fish larvae contributed to the growth of fish productivity.

Increasing the fingerlings survival and increasing the fish productivity of ponds require different approaches and require different requirements for the most important biological parameters. If the increase in the survival rate of the fingerlings increases with a decrease in the area of the pond and an increase in their overgrowth, the increase in fish productivity is associated with an increase in the pond area and a decrease in their overgrowth. A positive effect on the growth of fish productivity and survival of fingerlings is the increase in the planting rate of silver carp and spotted silver carp.