

**UDK:639.3****FEATURES OF FISH CULTIVATION USING POLYCULTURE METHOD IN  
WATER RESERVOIRS****Nurumbetova A - Talented Student****Ubaydullaeva G - Talented Student****Mamatov X.A. - PhD in Agricultural Sciences, Associate Professor***Samarkand State University of Veterinary Medicine,**Animal Husbandry, and Biotechnology***Keywords:** Pond, polyculture, feed, fertilizer, fish, fry.

**INTRODUCTION.** To develop the sector in the country, the President of the Republic of Uzbekistan, Sh.M. Mirziyoyev, issued Resolution No. PQ-2939 on May 1, 2017, "On Measures to Improve the Management System of the Fisheries Sector" and Resolution No. PQ-4005, "On Additional Measures for the Further Development of the Fisheries Sector." These resolutions established the legal and regulatory framework for fisheries. In particular, issues such as improving and updating the curricula and programs for training specialists in higher and secondary specialized vocational education institutions, as well as enhancing the qualifications of personnel in the fisheries sector, were raised.

Starting from February 1, 2022, individuals are allowed to engage in fish farming at home as self-employed persons.

From February 1, 2022, to January 1, 2025, tax benefits will be provided for entities that establish production of necessary equipment and technologies (aerators, pools, automatic feeders, RAS) for the intensification of fish farming. These benefits include a 50% reduction in corporate income tax (except for interest income from commercial banks), land tax for legal entities, property tax for legal entities, and water resource usage tax, provided that more than 80% of their income comes from the production of such equipment.

Although many fish species inhabit and reproduce in ponds, only a certain portion of them are utilized for economic purposes.

Fish species such as carp, grass carp, crucian carp, tench, bighead carp, common carp, pike, peled, trout, whitefish, and zander have delicious meat and grow relatively fast. However, some species are highly demanding in terms of habitat conditions. Other fish species (gudgeon,

bitterling, bleak, stickleback, and minnow) grow very slowly, have excessively bony bodies, and are almost unsuitable for human consumption.

**Common Carp (Sazan)-** The body of the sazan (common carp) is golden-colored, large, and covered with thick, tightly overlapping scales. Its mouth is mobile and has two pairs of barbels. The body length is approximately three times its height. Female carp reach sexual maturity at the age of 4-5 years, while males mature one year earlier, at 3-4 years. Under highly favorable living conditions, both sexes can reach sexual maturity a year earlier than usual. In natural environments, sazan can grow up to 1.5 meters in length and weigh up to 20 kg.

In well-warmed small water reservoirs, they begin spawning between May and June when the water temperature reaches 16-19°C. Their eggs are sticky, small, and yellowish, attaching to the leaves and stems of aquatic plants at the bottom of the pond. Depending on the water temperature, the eggs hatch within 3-7 days. The newly hatched larvae have a small yolk sac, which they use for nourishment while remaining attached to plant stems and leaves with the help of special filaments (byssus) for 1-2 days. After consuming the nutrients from the yolk sac, they begin swimming independently and searching for food. Sazan grow very rapidly. Depending on the availability of food in ponds, young fish can reach 30-100 grams or more by autumn. They are omnivorous, feeding on both animal and plant matter, including various plant seeds, fish eggs, and even larvae.

As autumn arrives and water temperatures drop, common carp gather in groups and settle into mud layers at the bottom of the water body, entering a state similar to hibernation, like some warm-blooded animals. During the winter months, they do not feed, leading to a 10-15% weight loss by spring. This weight loss occurs due to the consumption of stored proteins and fats for survival. Sazan are highly fertile, producing between 100,000 and 1.8 million eggs depending on their size. Through centuries of selective breeding, the common carp has been successfully adapted for pond aquaculture.

**Carp-** The carp is the domesticated form of the sazan (common carp). The main difference between carp and wild sazan is that carp assimilates food more efficiently, allowing it to grow faster under the same living conditions. Carp exhibit increased appetite and rapid growth when the water temperature is 23–26°C. However, as the temperature rises to 29–30°C, their appetite decreases, and food intake declines. This happens because as water temperature increases, the amount of dissolved oxygen decreases, leading to reduced digestion efficiency. For carp, a dissolved oxygen level of 5 mg/L is satisfactory, 6–7 mg/L is optimal, and 3–3.5 mg/L is the minimum threshold. Carp reach sexual maturity at 4–5 years of age, though in some cases,

depending on favorable living conditions, they may mature at 3–4 years, and occasionally even at 2 years. Female carp, which mature one year later than males, produce an average of 180,000 eggs per kilogram of body weight.

The standard weight of carp is:

- 25–30 g in the first autumn,
- 800–1200 g in the second autumn,
- up to 2.5 kg in the third autumn.

However, carp can grow much larger under ideal conditions (water temperature 26–27°C, dissolved oxygen 6–7 mg/L). In such cases, by the first autumn, they can reach 400–500 g or more. Carp are naturally very cautious, but they quickly adapt to humans. In pond aquaculture, they learn to associate humans with food, often swimming toward caretakers or feeding boats. Some even take food directly from sticks held by people.

**Grass Carp (White Amur)-** The grass carp belongs to the carp family and is distinguished by its large body size. It can grow over 1 meter long and weigh more than 30 kg, though the average size is 80 cm and 8–10 kg. Grass carp are widely found in the Amur River basin and China. They have an elongated, torpedo-shaped body, a broad forehead, and a semi-inferior mouth. Their meat is fatty and tasty, and they grow faster than sazan.

Grass carp are not very selective eaters. They consume higher aquatic plants, including tree leaves and flooded meadow grasses. Occasionally, they also eat insects, worms, and small fish. Juvenile grass carp initially feed on plankton, but after one month, they switch to plant-based diets. They reach sexual maturity at 4–8 years when they are 75–80 cm long.

**Bighead Carp-** The bighead carp is also part of the carp family and is widely distributed in the Amur River basin. Its eyes are positioned lower than the mouth, and its gill covers have a continuous, ribbon-like structure. This species prefers to live in large schools. During winter, they form massive groups in the lower reaches of the Amur River. When they sense disturbances such as sudden noise or water splashing, they jump out of the water toward the sound. Bighead carp have a dark bluish-green back, silvery sides and belly, shiny fins, and a large head. They are fast-growing and, in their early life stages, feed on both phytoplankton and zooplankton.

They reach sexual maturity at 7–8 years, at which point they measure 60 cm in length and weigh around 5 kg. They reproduce in 20–26°C water, and females release eggs in batches, producing 470,000–550,000 eggs on average.

**Conclusion.** The advantage of the polyculture method in fish farming is that it maintains water quality and allows multiple fish species to coexist without negatively affecting each other's habitat conditions.

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