

USE OF FERTILIZER IN FISH POND

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Fish is a delicious food item consumed by a large population of India. Proper cultivation and management of fish in the fish pond are very important to obtain a good production. It has been observed that the presence of an adequate amount of natural food in the pond is a crucial factor which influences fish growth in the water body. These natural feed, present in the waterbody also require food for their survival. Thus, various types of organic and inorganic fertilizer are used in aquaculture. They increase the amount of available nutrients in the ponds. These are very much essential for the growth of natural food as well as the growth of fish. So, adequate and optimum levels of fertilizer in the pond promote good fish growth in the water body. Two types of fertilizers are generally used for the culture of fish in the pond i.e. organic fertilizer and inorganic fertilizer. In this article, we have briefly described how to use fertilizer properly to ensure good productivity of fish and better economy of the farmers.

Inorganic fertilizer

Generally, nitrate and phosphate fertilizers are used in the pond. On the other side, fertilizers containing potassium are not used in the pond. Among nitrate fertilizers, urea and among phosphate fertilizer, single superphosphates are mostly utilized in the fish pond. Importance of phosphate-fertilizer application is more compared to other fertilizers in the pond because they contribute to the plant growth more prominently. Within a few minutes of application of phosphate-fertilizer in the water body, they are readily absorbed by plant-tissue

for their growth. Uses of nitrate fertilizers along with phosphate fertilizers create a synergistic effect on the benefits of using these fertilizers.

The application procedure of inorganic fertilizers in the fish pond

The main disadvantage of using phosphate fertilizer is their insolubility in water, but nitrogen fertilizers are very much soluble in water. So, phosphate fertilizers should not use in dry condition otherwise, they will be readily absorbed by bottom soil instead of being absorbed by plant tissue or phytoplankton. So, these fertilizers should be soaked in the water before 3-4 hours of their application. Then, the next day morning, it should be mixed with any nitrate-fertilizer in a large container and then should be spreaded in the pond.

Amount of inorganic fertilizer to be used in the pond

How much inorganic fertilizer should be used in the pond, depends upon the nature of the water and soil of the pond. Before application of the inorganic fertilizer in the pond, the density of the plankton should be determined in the pond which in turn, should be determined by the transparency of the Secchi disk.

- If transparency of Secchi-disk is between 30-40 cm, then generally no need to apply any fertilizer in the fish pond.
- If transparency of Secchi-disk is above 40 cm, then fertilizer should be used in 15-day intervals.
- If transparency of Secchi-disk is above 60cm, then fertilizer should be used weekly, until Secchi disk transparency reduced to 30-40 cm.
- If transparency of Secchi-disk is below 30 cm, then application of fertilizer in the fish pond should be totally prohibited.

Some other factors which determine the amount of inorganic fertilizer to be applied

- In the case of turbid water, there is no benefit of the application of inorganic fertilizer, as due to turbidity of the water, sunlight cannot adequately enter into the water.
- Before the application of fertilizer in the pond, aquatic plants present in the waterbody should be eradicated otherwise, nutrient of the fertilizers will be absorbed by those plants present in the water body. As a result of that, the growth of the aquatic plants will create problems in the culture of the fish species.
- In the case of the algal dominated pond, inorganic fertilizers should not be used at all.

- In case of cloudy days or before sun-rise fertilizers should not be used in the pond, as plants cannot perform physiological functions adequately in the absence of sunlight.
- If the wind blows in the pond from northward to southward, then the amount of applied fertilizer should be 30% in the north direction and 70% in south direction.
- If total alkalinity of the pond below 20 mg/l, then no benefit will be extracted from the application of inorganic fertilizers.
- In the pond, phosphate-fertilizers and lime should not mix with each other, as lime make precipitation of phosphate at the bottom soil of the pond.

Organic fertilizer

Animal and plant-derived fertilizers are known as organic fertilizer. Advantages of using organic fertilizers are:

- ❖ Organic fertilizers enhance the growth of zooplankton in the fish pond.
- ❖ Organic fertilizers disintegrate very slowly in the pond in a longer period of time and increase the amount of nutrient material in the pond; as a result, the pond becomes fertile.
- ❖ They create a synergistic effect on the function of inorganic fertilizer.

Classification of organic fertilizers: Organic fertilizers can be divided into two groups.

1. **Plant-derived fertilizer:** These kinds of fertilizers are produced from plant or plant-derived materials. Ex- compost fertilizers, oil-cake fertilizers etc.
2. **Animal-derived fertilizers:** These kinds of fertilizers are produced from animal or animal-derived material. Ex- poultry fertilizers, swine-derived fertilizers.

Some important organic fertilizers used in fish culture and their application procedure

- ❖ **Green-fertilizers:** This fertilizer is generally used in nursery pond. This fertilizer increases the amount of nitrogen in the pond, as a result of which productivity increases a lot.
- ❖ **Compost-fertilizers:** Different types of aquatic plants, grasses and leaves are mixed with raw cow-dung and then compost-fertilizers are produced. This fertilizer helps to control the pH of the fish pond.
- ❖ **Oil-cake fertilizers:** Among plant-derived fertilizers, most widely used fertilizer is oil-cake fertilizer. After extracting the oil from mustard, mohua, til and badam, the

residue is known as oil-cake. Oil-cake contains different chemical components like nitrogen, phosphate and potash. Generally, mustard oil cake and mohua oil cake are widely used in the pond.

Use of mustard oil cake

Mustard oil cake is used as fertilizer in the fish pond and also serves as supplementary feed. It is used as fertilizer in the fish pond after mixing with cow-dung. When it is used as supplementary feed in the fish pond, it should spread in the pond water directly after grinding it into small pieces.

Use of mohua oil cake

Initially mohua-oil cake act as a poison in the pond so, it kills unwanted fishes in the pond. Later it becomes converted into fertilizer so, it increases the productivity of the fish pond. This oil cake contains saponin, which is water-soluble. It enters the blood of fish, snake and frog through gill and mouth and destroys red blood corpuscles of blood and death of these unwanted species occur. After sometime, mohua oil cake degrades and increases the amount of nutrient components in the water. As a result, the growth of zooplankton enhances in the water body and it serves the function of fertilizers.

Amount of mohua oil cake to be used in the fish pond: To kill the unwanted fish species, 250 ppm mohua oil cake should be used in the fish pond.

The procedure of application of mohua-oil cake in the fish pond: Most of the portion of mohua-oil cake is in cake form, so it does not dissolve directly in water of the fish pond. So, if we directly use it in the fish pond in cake form, the optimum result does not occur. So, an adequate amount of mohua oil cake should be spread in the fish pond water, before the day of application in the evening.

Use of cow dung in the fish pond

- Raw cow dung can be used directly in the fish pond water.
- In case of application of cow dung fertilizer in the pond, cow-dung will be disintegrated with the help of microbes. As a result, cow-dung will release nitrogen, phosphorus and potash components in the water, which makes water very much fertile.

Disadvantages of using organic fertilizers

- ❖ Organic fertilizers especially animal-derived organic fertilizers should not be used in a fish pond in excessive amount.
- ❖ Application of excessive amount of organic fertilizers can create the problem oxygen depletion in the fish pond.
- ❖ Application cow dung in raw condition can give birth to some harmful bacteria in the pond,
- ❖ Use of organic fertilizers in the fish pond in large amount can become the cause of fish death in the pond later.

Conclusion

It is very clear that the use of fertilizer in the fish pond is an essential part of fish cultivation. Both organic and inorganic fertilizers can be used according to need. It helps in supplying food for the fish and increasing the growth rate. Good production will secure the economy and livelihood of the fish farmers.

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