

Duck Farming practices

In duck farming along with fish the following management practices are followed:

1. Construction of duck house:

A low cost house can be constructed over the pond water surface or on the pond embankment using locally available materials like- bamboo, wood, etc. The hole size of the floor should be around 5 cm². Each duck requires 1 to 1.5 sq. feet space for their comfortable stay. The height of the house should be around 2.5 m with well ventilation and preferably side walls is fitted with ironwire or bamboo netting. The entry and exit of duck into the pond should be like a bridge pattern made up of bamboo or wooden. Along the



Fig: A view of a fixed duck house system on the pond dyke

periphery of the fish farm there should be fencing to prevent the outgoing of the ducks from the fish farms.

2. Selection of duck

Khaki Campbell and Indian runner are suitable breed of ducks because of their disease resistant, faster growth and high egg laying capacity

3. Numbers of duck to be farmed:

One duck voided about 125- 150 gms. excreta in a day. So 200- 300 ducks are sufficient for 1 ha pond area.

4. Housing of ducks:

3- 4 months aged ducklings are introduced into the duck house after 1 month of stocking the pond with fish seed. They are brought to the duck house after giving all prophylactic treatments against viral diseases of ducks and after disinfecting the duck house and the materials that are going to use in the duckery practices.

5. Feeding management:

Ducks get their most of their required food from the pond but that is not enough. Therefore, they are to be fed with balanced supplementary feed. A mixture of any standard balanced poultry feed along with good quality rice bran in the ratio of 1:2 by weight can be fed to the ducks at the rate of 100 gm/ day/ duck in 2 times i.e. morning and evening hours of a day. Duck should not be fed with mouldy feed. Feeding the ducks with manganese sulphate/ calcium at the rate of 10 mg/ kg feed and also with Vit.- A (Elvitone or Vimarel, etc.) along with drinking water gives encouraging result from duckery practice.



Fig: a view of bamboo fencing along the pond periphery

6. Egg laying management:

Duck start laying eggs when they become 7 months old. Each duck lay about 150—200 numbers of eggs in every year. They lay eggs from the late night to about 9 a.m. So they are allowed to go into the ponds after 9 a.m. For laying eggs nest are prepared with bamboo or wood or with tin by keeping some straw or hay inside the nest. When the ducks become 18 months aged then their egg laying capacity is reduced and they are sale out and a new stock of ducklings are introduced into the duck house.

7. Health care.

The main diseases of ducklings and ducks are- duck cholera, duck hepatitis and duck virus disease etc. Ducks should be vaccinated against all viral diseases.

A disease infected duck becomes listless, less bright eyes and also watery discharge comes out from the eyes and the nostrils. Sneezing and coughing sound from the duck house is warning tone for the coming disease. Treatment of diseased ducks should be given with discussion of a veterinary expert.

8. Production.

From the integration of duck-cum- fish culture from a pond of 1 ha water spread area in 1 year 4000-5000 kg fish, 25000 - 30000 duck eggs and - 600-700 kg duck meat can be produce.

INTEGRATED DUCK-CUM FISH FARMING SYSTEM



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What is Integrated duck-cum Fish system?

In this system the rearing of duck is combined with fish culture by constructing duck housing units on the pond embankment or over the pond in such a way that the wastes are directly drained into the pond.

Advantages of duck-cum-fish farming:

- Ducks are highly compatible with fishes.
- Fish utilizes the feed spilled by ducks and eat their droppings directly by some fishes.
- Ducks called as *manuring machine* as they fertilize the ponds by their droppings saving the expenditure involved in labour in applying manure in the pond.
- Ducks keep water plants in check.
- Save fertilizer cost.
- Save supplementary feed cost (account 60%).
- Duck get its required quantity of water from the fish pond.
- Aerate the water while swimming hence called *Biological aerator*.
- Ducks increases the pond productivity by releasing the nutrients from the pond bottom soil through *dabbling* the pond bottom mud.
- From the same places at the same time duck meat & eggs and also the fish can be produced.
- Duck get 50- 75% of their total feed requirement from the pond itself in the form of aquatic weeds, insects, mollusks, etc. which do not form the food of the fish.

This integrated farming of fish and duck can be divided into 2 groups:

- ◆ **Fish culture practice**
- ◆ **Duckery farming practice**

Fish culture practice

Fish culture practice followed in the integration of duck-cum-fish farming is the "Composite fish culture system".

Composite fish culture:

composite fish culture system can be divided into-

1. Pre-stocking management.

i. Construction of a fish farm/
Renovation of an existing fish farm.

2. On stocking management.

i. Selection of species.
ii. Fish species to be stocked.
iii. Stocking

3. Post stocking management.

i. Liming.
ii. Fertilization.
iii. Feeding.
iv. Water quality management.
v. Fish health management.
vi. Harvesting management.

1.. Pre-stocking management.

i. Construction of a new fish farm/ Renovation of an existing fish farm:

Pond digging: During digging of a pond along the side slope should maintained so that it is not eroded. This side slope depends upon the soil quality. For loamy or clay loam soil the side slope should be 1.5: 1. If the selected site contains more sand then this side slope should be little more. Fish pond embankment should be strong enough and their height should be 1 ft. more than the high flood level of the selected site. The bases of the embankments are constructed based on the height and slope required for it.

Renovation measures of fish ponds of an existing fish farm.

Pond should be completely dried during dry season by pumping

out the pond water and the pond bed is exposed to sunlight. After drying mud from the pond bed should remove. Here in this case pond water depth is need to be considered, in any case it should not go beyond 2.5 meters for good productivity. Then the pond bed is ploughed and dried. Then apply lime to the dry pond bed depending on the pond soil and water pH given in the table below:

Soil & Water pH	Lime (kg/ha)
4.5-5.0	2,000
5.0-6.0	12,00
6.0-6.5	1000
6.5-7.0	400

Repairing of dykes:

During the drying period repairing of pond embankments (if required) are done.

Water filling, liming & fertilization:

Afterwards the pond is filled with water to a depth of 2- 2.5 meter. To maintain a desire 2- 2.5 m water depth water inlet and out let may be

constructed at the pond dyke with measures to prevent the entry of unwanted organisms and also to prevent the escape of cultured fishes. Then water pH is measured and based on the pH value liming is done as mentioned above.

After 7- 10 days of liming fertilization pond water is done. Duck dropping contains 81% water, 0.91% nitrogen and 0.38% phosphorous. Ducks are given free range from 9 a.m. to 5 p.m. in the pond and the excreta released during this period are easily mixed with pond water and fertilize it. Again duck droppings voided during night at the duck house are collected and applied to the fish pond in the morning hours to fertilize the pond water. Therefore, there is no need of using extra fertilizer as mentioned above in this type of integrated farming. By stocking 250- 300 ducklings/ water spread area the required quantity of duck excreta, i.e. 10000-15000 kg/ year / ha can be received. When phytoplanktonic bloom is seen over the surface water of fish pond then application of duck droppings to the pond should immediately be suspended.

Renovation measures of a pond, which cannot be dried even by dewatering:

Renovation measures of an existing fish farm's ponds which can not be dried even by pumping out water are:

i) Removal of aquatic weed:

These unwanted aquatic weeds could be removed- manually, mechanically, chemically and biologically.

ii) Removal weed fishes, insects, unwanted organisms, etc.:

This is done by repeated netting or by using chemicals. Soap-oil emulsion (soap: oil = 1: 3) over the pond water surface is most commonly used technique to kill the insects in fishponds. Commercially available bleaching powder@ 97- 113 Kg/ha can also be used as fish toxicant.

iv) Partial replenishment of water:

Since total dewatering is not possible, so depending on the feasibility some percentage of pond water may be pump out and the same is refilled with new water. But the water depth should be restricted to 2- 2.5 m for good production of fish.

2. On stocking management.

i. Selection of species.

Numbers of fish species are available for composite fish culture. But a species selected for culture should have the following characters-

1. Fast growth rate.
2. Good food conversion efficiency.
3. Acceptability of supplementary and natural food.
4. Adaptability to crowded conditions and resistance to diseases.
5. Ability to withstand changing physico-chemical and biological conditions of the pond water.
6. Good market value



Fig: Renovation of old pond

ii. Fish species can be stocked:

Rohu (*Labeo rohita*), Catla (*Catla catla*), Mrigal (*Cirrhinus mrigala*), Silver carp (*Hypophthalmichthys molitrix*), Common carp (*Cyprinus carpio*), Grass carp (*Ctenopharyngodon idella*), Tilapia (*Oreochromis mossambica*), Magur (*Clarias batrachus*), Java puthi (*Puntius javanicus*) Kurhi (*Labeo gonius*), etc.

iii. Stocking:

In composite fish culture in stocking pond fish seed of 10- 15 cm length (fingerling) is stocked at the rate of 7000- 8000 nos. / ha. Considering the seed availability, productivity, size & depth of pond, market demand etc.

1. Post stocking management.

i. Liming.

It is done based on the soil and water pH. Liming dose and schedule mentioned earlier.

ii. Fertilization.

Already mentioned that the duck excreta is rich in nitrogen and phosphorous. Therefore, there is no need of using extra fertilizer as mentioned above in this type of integrated farming

iii. Feeding.

Apart from natural food most of the cultured fish species takes artificial feed. In the integration of fish farming with duck farming practice supplementary feeding to the cultured fish is not required. This is because duck excreta helps in fertilizing the pond water and produce the fish food organism like- phytoplankton and zooplankton. Apart from that some fish like - common carp take duck dung directly as their feed.

iv. Water quality management.

Some of the water quality problems encountered in fish farms are-

a) Depth of water:

The depth of water in the fish cultured pond is important factor from the productivity point of view. The optimum depth of water in fish pond is 2- 2.5 m. If there is any change in the depth of water in the fish pond is seen then it should be corrected.

b) Turbidity of pond water:

This is occurring may be due to more clay content in the soil of fish pond or it may cause due to overgrowth of phytoplankton. To control this water quality problem apply aluminium (filter alum) sulphate i.e. $Al_2(SO_4)_3 \cdot 14 H_2O$ @ 10-40 mg/ lit of water. Actual quantity can be determined by putting alum in a glass of turbid water. After applying alum liming should be done as per the water pH as mentioned in the corrective measures of water pH.

c) Dissolved oxygen (DO):

Dissolved oxygen range in the stocking pond should be in between 5- 8 ppm. In low DO case feeding and fertilization in the pond should immediately be stopped. Turbulent the water with the help of a split bamboo. Harvest the table size fish and reduce the density of fish in the pond. Supply of water from a nearby source.

d) Ammonia:

ammonia (NH_3) is lethal at a level above 0.02 ppm. If the unionized ammonia concentration is increased then the fish may die. Control the water temperature, pH and also the concentration of phytoplankton in the pond.

e) pH of water:

For fish culture soil and water pH should be in the range of 7.5- 8.5. Acidic pH is controlled through liming . Alkaline pH can be controlled by water replenishment and through the application of gypsum.

V. Fish health management:

Cultured fish should check regularly for their health.

Vi. Harvesting management:

When the cultured fish reaches 750 gm to 1 kg in weight then they are harvested from the pond. The harvesting may be done by removing the complete stocks of cultured fishes or by removing the only table size (750 gm to 1 kg) fishes partially based on market demand. In case of partial harvesting the numbers of fish harvested from a pond is replenished with equal numbers of small fishes from nursery ponds of the farm. This helps in getting more money.



Fig: Duck excreta fertilizing the pond during free moving in the pond water