

SS2 NOTES ON LIVESTOCK FARMING FIRST TERM.

SCHEME OF WORK

WEEK 1: INTRODUCTION TO AQUACULTURE

1. Meaning of fish farming
2. Systems of Aquaculture (Extensive, Semi-intensive, Intensive)

WEEK 2: FISH POND CONSTRUCTION

1. Site selection
2. Pond design, pond preparation.

WEEK 3: FISH BREEDS AND FINGERLINGS

1. Common species in Nigeria (Cat fish, Tilapia)
2. Fingerling production

WEEK 4: FISH NUTRITION AND FEEDING

1. Fish feed types
2. Feed formation
3. Feeding methods

WEEK 5: FISH HEALTH AND DISEASES

1. Common fish diseases
2. Symptoms
3. Prevention/Treatment

WEEK 6: FISH HARVESTING

1. Methods of harvesting
2. Processing of fish

WEEK 7: FISH MARKETING

1. Storage, transportation
2. Sales, channels

WEEK 8: ECONOMICS OF AQUACULTURE

1. Cost-benefit analysis, Record keeping
2. Challenges of fish farming

TOPIC: INTRODUCTION TO AQUACULTURE

Aquaculture is a branch of agriculture that deals with the study of fish and other aquatic animals.

Definition and Importance of Fish Farming

Fish farming refers to the production of selected variety of fishes in confined bodies of water (pond)

The area of agriculture which involves the use of water culture for the production of animal protein is termed Fishery.

Importance of Fish Farming

The significance of fish farming include the following:

1. Fish plays important roles in the diet of man because it contains large proportion of protein - a nutrient needed for growth, tissue repair and body building.
2. Fish farming is carried out for its aesthetic purposes.
3. The skin of some large fishes are used as leather in some developed countries of the world.
4. Fish oil can be used for production of cod liver oil or serve as a useful ingredients in the production of soap and detergents.
5. Fish farming provides employment opportunities to many people.
6. The whole fish and fish bones can be prepared into livestock feeds.
7. Fish farming provide veritable source of income.
8. Small fishes are used in the laboratory dissection and in the study of biological sciences.

SYSTEMS OF QUACULTURE

The systems of practicing aquaculture can be classified into three - namely:-

1. Extensive system
2. Semi-intensive system
3. Intensive system.

TOPIC: FISH POND CONSTRUCTION

1. Site Selection:

In selecting a suitable pond site, the farmer has to consider the following factors, namely:-

- a. Topography: The ideal land site should be sloping or flat.
- b. Perennial or constant availability of water and its quality must be a priority.
- c. Type of soil is key: The soil should be non-sandy to avoid seepage of water and it should contain a good amount of clay.
- d. Nearness or closeness to place of abode to avoid fish theft is very important and this will ease management.
- e. Nearness and easy access to roads and market for quick disposal of fish is very essential because of high perishability of fish.
- f. The area selected should not be thickly populated.

2. Pond Design:

Important Features of standard Fish Pond:

A standard fish pond should have these features in order to ensure proper and successful growth of fishes cultured;

- I. The fish pond should have an optimum temperature
- II. It must not be too acidic or too alkaline. P^H below 4.5 and above 9.2 is lethal.
- III. The pond should be adequately aerated.
- IV. The pond must have enough nutrients for the growth and development of aquatic plants.
- V. It must have in it adequate quantity and variety of plants and animal life to provide enough food for fish and other aquatic organisms.
- VI. It must not be too small or too shallow as these conditions are unsuitable for fish farming.
- VII. Excavation should be as deep as 3.5m deep.
- VIII. Banks should be high, wide and compacted.
- IX. A good pond should range from 100 - 1000m²

3. Pond Preparation, Establishment and Maintenance.

The following operations are to be carried out when establishing a fish pond before stocking. These operations include the following:

- I. Selection of suitable site.
- II. Clearing and stumping the site.

III. Construction of dams, dam slope, monks, boards and Screen.

IV. Construction of core trench and spillway and distribution channel.

V. Impoundment of pond. This entails filling the pond with water.

VI. Pond-fertilization: Fertilizer encourages the growth of micro-flora. It is done 15 days before stocking the pond with fishes.

VII. Pond inoculation: This involves the proper introduction of plankton species into the pond.

VIII. Liming: The addition of calcium carbonate (CaCO₃) powder to sides and bottom of the pond to seal pores and prevent water loss. It helps to reduce the acidity of the pond water and encourages growth of planktons.

STOCKING A FISH POND

Stocking of a fish pond is the putting of fish into the pond and when stocking, a number of factors should be considered and these include;-

A. Maintenance of the right stocking density. It is necessary not to over stock or under stock the pond. Overstocking results in overcrowding which in turn leads to cannibalism while under stocking means under-utilization of the available resources.

B. Quality and size of fingerlings: It is important to stock medium to large fingerlings that are agile and healthy.

C. Time of the day for stocking: It is advisable to stock fish fingerlings in the early morning when the temperatures are lower and the fishes are less active.

D. Compatibility of fish varieties: It is necessary to stock only those varieties of fishes that can be raised in the same pond without one preying on the other.

TOPIC: FISH BREEDS AND FINGERLINGS

Common Fish Species in Nigeria;

The commonest fish species reared and kept by fish farmers in Nigeria are

1. Catfish and
2. Tilapia.

Even though there are other species of fish that can be found in natural fresh water bodies in Nigeria, the above listed two species are the one's reared in ponds by farmers because of their seemingly easy adaptation to pond life.

Hatching of Fish Eggs and Production of Fingerlings

Fish is the only animal that God created and did not make provision for their males and females to mate while reproducing.

The matured female fish makes her nest in a convenient part of the river, stream, natural pond bottom, secretes a substance that appear gumish as a foundation for her nest and lay her eggs in hundreds on the nest and finally secretes another powerful scenting substance round the eggs and then swims away.

The matured male counterpart of the same specie of the fish swimming in the same water body a long distance away is attracted to the nest because of the very strong scent and begins to swim towards the direction of the nest. The closer the male gets to the position of the egg, the stronger the scent becomes. Once it reaches the nest, it would position itself over the nest and ejaculates its sperm over the eggs after which it swims away. After four to five days, the eggs hatch into fries, to post fries, to pre-fingerlings, to fingerlings, to post-fingerlings, to pre-juveniles, to juveniles and post-juveniles after which they are then transferred to their ponds for subsequent growth and development.

TOPIC: FISH NUTITION AND FEEDING

The feeding pattern adopted by a fish farmer depends on the system of fish farming he practice. Under extensive system of fish farming or management, no supplementary feeding is practiced. Under semi-intensive system, the fish picks whatever it can in the water in addition to the supplementary feeding. However, in intensive system, all the feeds given to the fish come from external sources.

It is important to be sure that fish have good feed. Feeding and fertilizing work together to make the pond successful. The growth of the fish in the pond is a dependant on the amount of feed available in the pond.

The requirement of fish vary according to species.

Newly hatched fry eat from their yolk sacs and then they eat the smallest phytoplankton in the pond.

Fish feed can be natural or supplementary. Natural feed are:-

- i. Phytoplankton
- ii. Zooplankton
- iii. Snails
- iv. Worms
- v. Insects that can be found in the pond.

They are best feeds for fishes.

However, if the pond is not producing enough feed for good growth, the farmer resorts to the use of supplementary feeds. Typical supplementary feeds are:-

- i. Bread crumbs
- ii. Rice bran
- iii. Fish meal
- iv. Ground maize
- v. Broken rice
- vi. Soyabean cakes
- vii. Sweet potatoes
- viii. Guinea grass
- ix. Left over animal feeds and
- x. Animal manure

Tilapia eats anything including supplementary feeds. This is one of the reasons why Tilapia are regarded as very good pond fish.

Inorganic fertilizers are also used in fish pond. These fertilizers help in phytoplankton and zooplankton to grow fast as feed for fish in the pond.

TOPIC: FISH HEALTH AND DISEASES.

Although fish diseases and parasites are not common, however under intensive method of management characterized by overcrowded conditions, the stress may reduce the performance and resistance to disease and tolerance to parasites. These diseases and parasites reduce the performance of fish and in severe cases cause their death. For this reason, adequate sanitary conditions should be maintained and fish should not be overcrowded. There are some other factors that cause fish mortality in the pond and these include:-

- i. Absence of oxygen or low oxygen concentration in water resulting from high temperature and rate of decomposition of excess feed in the pond.
- ii. Pollution as a result of accumulated stale feed and organic manure at the bottom of the pond.
- iii. Excessive manuring lead to a bloom of algae and some algae in the bloom excrete substances that are toxic to fish.
- iv. Use of toxic chemicals by poachers to kill fish for example use of gammalin 20.

CONTROL MEASURES FOR FISH DISEASE

Diseases and pests and other factors that cause mortality of fish in the pond can be controlled by the following.:

- i. After cropping, the empty pond should be exposed to sunlight. By this method, the solar energy is used to disinfect the pond against parasites and pathogens.
- ii. Each batch of fish should not be kept for too long a time. It is recommended that the growing period of fish in a fish pond should not be kept for too long a time and should not exceed 200 days.
- iii. Improve management during stocking, feeding and fertilizer application should be adopted.
- iv. Ensure that no deadly pollution is allowed in the pond.

TOPIC: FISH HARVESTING OR FISH CROPPING

Harvesting of the fish is carried out when the fishes have reached table size or desirable size.

After 6 - 9 months of culturing the fish, depending on the species of fish cultured, cropping can be made for sale at the market or for consumption or for preservation.

Cropping can either be total or partial.

1. **Partial Cropping** refers to the situation whereby not all the fish in the pond is harvested at the same time. Fishing equipment or tools such as;

I. Hook and Line

II. Seine net

III. Gill net

IV. Cast net, may be used.

On the other hand, selective cropping and thinning of stock may be practised. In selective cropping, only the matured fishes are cropped with special type of Gill net; while in thinning, some fishes are collected from time to time so as to reduce overcrowding, overstocking and competition in the pond. Thinning is a very important management with Tilapia.

2. Total Cropping

This method involves or entails complete drainage of all the water in the pond to enable the farmer pick all the fishes in the pond.

If drainage has to be done during the hot period, then it should be carried out in the morning when the weather is still cool. Drainage must be slow to enable the fishes to follow the lowering of the water. If drainage is too fast, some of the fishes may not be swept up against the screens and be injured. Necessary precautions should be taken in order to ensure their good condition.

TPIC: PROCESSING OF FISH

Prior to or before the preservation of fish, the harvested fish fishes are processed to ensure good quality fishes ready for consumption.

Fish processing entails or involves the removal of the protective covering of fishes such as:-

- a. Scales
- b. Gills
- c. Fins and
- d. Guts.

ASSIGNMENT:

Write concise notes on fish preservation under the following headings:

Methods of fish preservation:

- Sun-drying; merits and demerits
- Smoking or Charring; Advantages and disadvantages
- Salting or Brining; Advantages and disadvantages
- Refrigeration or Freezing; merits and demerits
- Canning; Advantages and disadvantages

TOPIC: FISH MARKETING

This is the buying and selling of fish which takes place between different categories of people in the distribution channel. The categories of individual include:

1. Producers
2. Middlemen
3. Wholesalers
4. Retailers
5. Consumers

FISH STORAGE AND TRANSPORTATION

Large quantities of harvested fishes are stored in cool rooms and transported in special refrigerated vans with cold compartments in the case of fresh fish while dry fish are transported in properly aerated vans.

ECONOMICS OF AQUACULTURE

The principal basis of the economics of aquaculture is anchored on cost-benefit analysis.

The main reason why a farmer would venture into aquaculture enterprise is that he/she had ascertained through careful and meticulous feasibility study that all things being equal 'ceteris-paribus' that the business will yield profit. This can only be achieved through proper record keeping.

ASSIGNMENT:

Write short notes on challenges of fish farming.