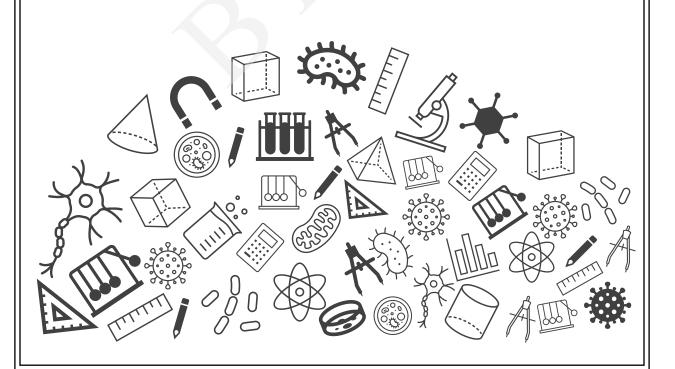
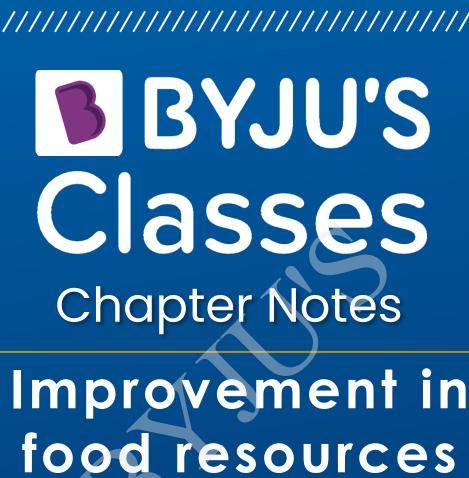


Grade 09 Science Chapter Notes





Grade 9



Topics to be Covered



1 - Crops
1.1 Uses of crops
1.2 Types of crops

- 2 Crop Variety Improvement
 - 2.1 Hybridisation
 - 2.2 Genetic Modification
 - 2.3 Factors that determine the use of crop variety improvement methods
- Crop Production Management
 3.1 Nutrient Management
 3.2 Cropping Pattern
 3.3 Irrigation Techniques
- Crops Protection Management
- 5 Animal husbandry
 5.1 Cattle farming
 5.2 Poultry farming
 5.3 Fish farming
 5.4 Bee-keeping

Mind Map Bee-keeping Cattle farming Poultry farming Fish farming Animal husbandry Improvement in food resources Crop and its management Crop variety Crop production improvement improvement **Crop protection** management Nutrient Hybridisation Genetic management modification Cropping Crop variety pattern Irrigation improvement factors techniques

Improvement in food resources



1. Crops

A plant such as a grain, vegetable, or fruit grown in large amounts on farmland and harvested for the purpose of sustenance.

1.1 Uses of crop

- **Nutritional Requirements:** Crops provide us with nutrients like, carbohydrates, proteins, fats, vitamins and minerals.
- Economic Requirements: Harvested crops are sold on for the purpose of economic sustenance.

1.2 Types of Crops

Rabi Crops

Grown during winter season i.e., from November to April.

Ex: wheat, pea, linseed, mustard, etc.

Kharif Crops

Grown during rainy season i.e., from June to October.

Ex: paddy, soybean, cotton, maize, etc.





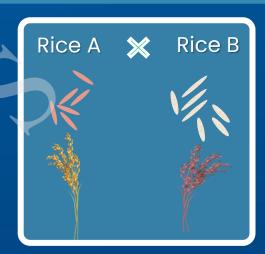


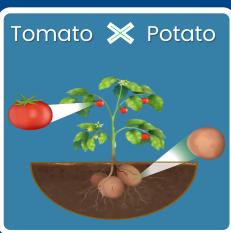
2. Crop Variety Improvement

- The process of choosing and creating better quality seeds.
- It is done by two methods.

2.1 Hybridisation

- · Crossing between genetically dissimilar plants
- It is further divided into three methods:
- a) Inter varietal: Cross between two varieties of the same species is done. For example, a cross between two different varieties of rice (disease-resistant (rice A) x pest-resistant (rice B).
- b) Inter specific: Cross between two different species of the same genus is done. For example, a cross between tomato (Solanum lycopersicum) and potato (Solanum tuberosum) is done to obtain pomato.
- c) Inter generic: Cross between two different genera is done. For example, a cross is done between radish (Raphanus) and cabbage (Brassica) is done to obtain Brassicoraphanus.









2.2 Genetic Modification

- Modification of genes to get desired characteristics
- The steps of genetic modification are:

a) A gene with desired quality is taken.

b) This gene is added in a vector DNA which acts as a carrier.

c) This modified DNA is introduced into the plant.



d) Finally, this genetically modified plant is propagated to obtain its seeds and further cropping on a large scale.

d)





2.3 Factors that determine the use of crop variety improvement methods



High yield: Increase crop productivity per acre area.



Increase quality: Different crops require different quality upgrades.

For ex.: Shelf storage, nutrients, etc.



Biotic and Abiotic Resistance:

Resistance towards living factors (biotic) like pests, insects, nematodes, etc., and towards non-living factors (abiotic) like salinity, heat, etc.



Wider adaptability: Crops that can be grown in different terrain and environment.
Ex: Cabbage growing on plain land and terrain.



Change in maturity duration: Crops with less maturity duration are more economical.

Ex: One crop can be grown twice in one season.



Desired agronomic characters: Characteristics contributing to economic benefits attained from the field of agriculture. Ex: Tallness of fodder crops for easy cutting



3. Crop Production Management

- It includes adopting techniques to ensure better yield.
- Crop production management is done under three categories: Nutrient management, cropping pattern and irrigation technique

3.1 Nutrient Management

- Plant get their nutrients from air (carbon and oxygen), water (hydrogen and oxygen), and soil (a major source of nutrients).
- Nutrients present in the soil are classified into micro and macro according to their requirement by the plants for their growth and development.

Macro-nutrients

Required in larger amounts.

Nitrogen, Potassium, Phosphorus, Sulphur, Magnesium, Calcium

Micro-nutrients

Required in small amounts.

Copper, Calcium, Molybdenum, Zinc, Boron, Manganese, Iron

Impact of nutrient deficiency







Loss of reproductive ability

Stunted growth

Increased susceptibility to diseases



Fertilisers

- Commercially produced (in factory) plant nutrients (inorganic salts) supplied to the crops to increase productivity.
- Fertilisers are nutrient-specific and they are expensive.
- Have negative effects like reduction in soil fertility.

Manure

A natural growth enhancer containing a large amount of organic matter and supplies minor quantities of nutrients.



Compost

 Organic wastes decomposed by microorganisms to form simple nutrients.



Vermicompost

Prepared by earthworms that speed up the composting process



Green Manure

 Specific plants such as Sunn hemp, guar are grown to be incorporated into the soil which decomposes to turn into nutrients that are made available for the main crops.



3.2 Cropping pattern

- Indicates the time and arrangement of crops in a particular land area.
- Can be done in 3 ways:

Mixed cropping



Growing two or more species or cultivars of the same species **simultaneously** in the same field

Intercropping



Growing two or more crops with different nutrient requirements, simultaneously on the same field in a definite pattern

Crop Rotation



Growing different kinds of crops in **recurrent succession** on the same land



3.3 Irrigation techniques



Tanks

Small-scale reservoirs that supply water to a nearby field





Water is taken from groundwater

Dug well:

Water is taken from water-bearing strata

Tube well:

Water is taken from deeper strata

Canals



Connected to the river and divided into distributaries to supply river water to the fields.

River-lift system



Directly using rivers as a source of water without the use of canals



4. Crop Protection Management

Protection and storage of the crops during their growing phase and also after their harvesting.

Pre-production management



Crops destroyed by pests, microbes, and unwanted plants (weeds) during growth of crops

Methods to control



- Mechanical removal of the weeds.
- Spraying of pesticides and herbicides.

Post-production management



 It includes the protection of crops from biotic and abiotic factors post-harvest and its storage.

Methods to control



- Clean and dry storage of the produce.
- Fumigation using pesticides
- Use of sun for drying the seeds pre-storage.

5. Animal husbandry



Animal husbandry is the **scientific management** of animal livestock which involves feeding, breeding, and disease control.

5.1 Cattle farming

Rearing animals like goats, cows, horses, buffaloes, etc., for milk and labour.

The cattle animals are divided into two categories:

Milch animals

Reared for the purpose of milk production.
Ex: Cows, Buffaloes,
Goats, etc.

Draught animals

Reared for the purpose of labour.

Ex: Horses, Donkeys, Camels, etc.

Cattle Breeding

Mating animals with desirable quality to produce highly productive and suitable animals.

Example of cross breeding



B

Requirements of Cattle farming

- Providing proper and clean shelter facilities to cattle for their health as well as to produce clean milk.
- It includes:
- 1. Sloping of floors and providing well-ventilated shelters.
- 2. Regular brushing and bathing of animals to remove dirt and unwanted hair.
- 3. Vaccinating the animal to protect them from diseases and infections.

Cattle feed

Roughage:

- Feeds with a low density of nutrients, with crude fiber content.
- Helps in digestion.



Hay



Fodder

Concentrate:

- A mixture made up of protein supplements.
- Helps increase the content of fat in milk.



Gram



Oil-seed cake

Cattle diseases

External parasites, internal parasites, and microbes like bacteria cause various diseases to cattle.



5.2 Poultry farming



- The rearing of birds is called poultry.
- It is done to obtain eggs and broilers for consumption purposes and on this basis, it is divided into:

Layer

Layers are egg-laying poultry birds which are raised for the purpose of commercial egg production.



Broiler

Breeding of a special variety of chicken for edible purposes.



Cross breeding in poultry

The aim of cross-breeding is to produce chicken with desired qualities like tolerance to temperature and low maintenance.



Poultry feed

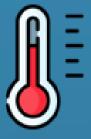
- The daily food requirement for broilers is protein rich with adequate fat. The level of vitamins A and K is kept high.
- For **egg layers**, the daily feed is kept high in **protein** and **calcium** for good eggs and strong eggshells.



cake
rich in
protein and
fat content

rich in protein and fiber content

Poultry Care



Temperature maintenance



Healthy poultry feed



Housing hygiene

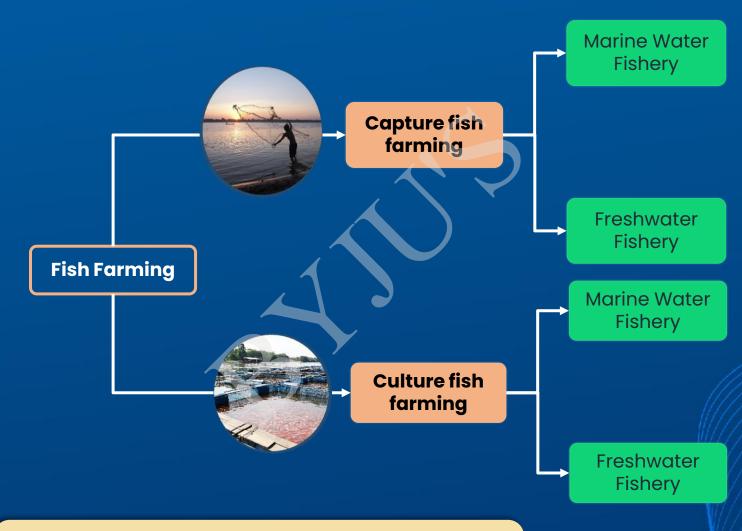


Controlling diseases



5.3 Fish farming

- The rearing of aquatic organisms like fish, prawn, crab, squid, and other molluscs commercially in enclosures to be sold as food.
- Fish farming is also known as aquaculture.



Benefits of culture fish farming

More yield

Greater survival rate

Complete utilisation of food resources

Culture fishes



Marine fishes

Bombay duck



Pomfret



Salmon

Inland fishes



Benefits of fish meat

- 1. High in protein
- 2. Easily digestible
- 3. Rich in vitamin A and D



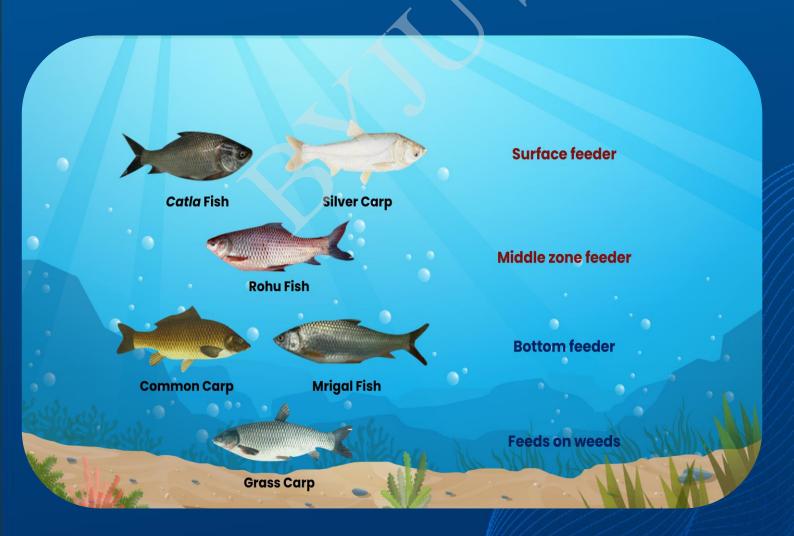


Pisciculture

Rearing of only fishes commercially in enclosures like tanks or ponds to be sold as food.

Composite fish culture

- It is also called mixed fish farming.
- In this different fishes are rearing at the same place as per their feeding zone.



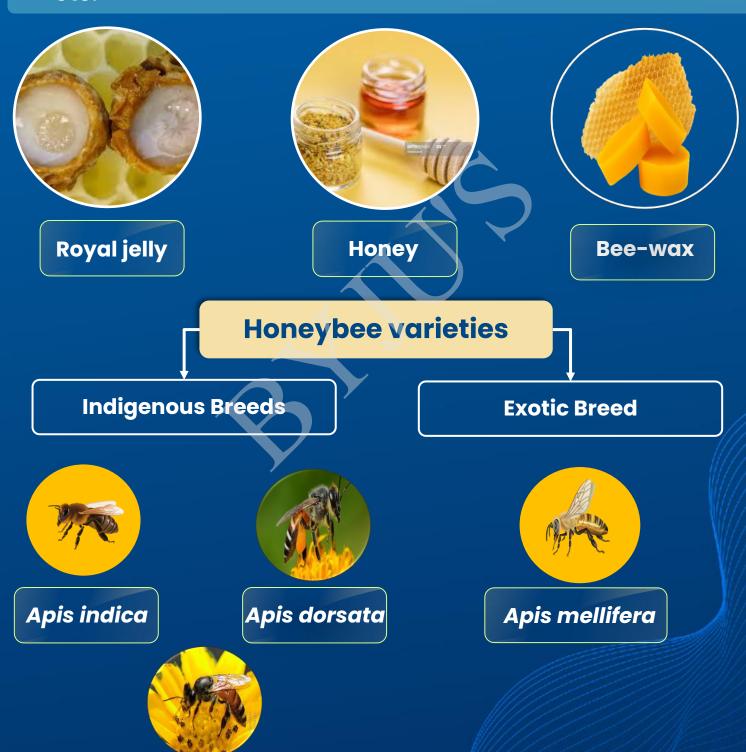




- The rearing of honeybees for honey and other commercial products.
- It is also known as apiculture.

Apis florae

 The products obtained are honey, royal jelly, bee wax etc.





Desired characteristic of bees for apiculture



Yields a large amount of honey



Disease resistant



Stay for longer period in the beehive

Types of Honeybees in a beehive

WORKER 22-42 Days Life span



The WORKER BEES makes food. They build the hive. They guard it. They look after baby bees, makes bee wax.

QUEEN

2-7 Years Life span



Each hive has only one QUEEN BEE. She is the only bee who lays eggs.

DRONE

90 Days Life span



bees. They do not work. They mate with the queen bee.