

Revision Notes for Class 8 Science

Chapter 1 – Crop Production and Management

Crop production and Management:

- Regular production, proper management, and distribution of food are all required to feed a huge population.
- **Crop:** A crop is formed when plants of the same kind are grown and cultivated on a big scale in one location.

A. Crops in India are divided into two groups based on the seasons: Rabi and Kharif crops.

B. Seeds sown at the proper depths and distances produce an excellent yield. After selecting healthy seeds, a good variety of seeds is sowed. Seed drills are used to sow the seeds.

C. Organic manure and fertilisers must be used to replenish and improve the soil. With the advent of new crop varieties, the use of chemical fertilisers has soared.

Crop Production Basics Include:

- (i) Preparation of soil
- (ii) Sowing
- (iii) Adding manure and fertilisers
- (iv) Irrigation
- (v) Protecting from weeds
- (vi) Harvesting
- (vii) Storage

Preparation of Soil:

- Soil preparation is the initial and crucial step in cultivating crops for food production.
- Before sowing seeds, the soil must be properly prepared to create an optimal environment for crop growth.
- This preparation involves several processes, such as ploughing, levelling, and manuring, which are essential for ensuring the soil is fertile and well-aerated.
- Various tools and equipment, including ploughs, harrows, and tillers, are used to carry out these processes effectively.
- Proper soil preparation also helps in removing weeds and enhancing the soil's ability to retain moisture, which is vital for healthy crop growth.
- Ultimately, well-prepared soil lays the foundation for successful cultivation and higher crop yields.

Tilling or Ploughing:

The process of loosening and turning the soil is known as tilling or ploughing. This is achieved using a tool called a plough. Tilling helps prepare the soil for planting by breaking up compacted layers and improving its texture and aeration.

Sowing: When seeds are sown at the right depths and distances, they provide a healthy yield. After selecting healthy seeds, a good variety of seeds is sowed. Seed drills are used to sow the seeds.

Agricultural Implements

Plough:

A plough is a device used by farmers for various tasks, including:

- Adding fertilisers to the soil

- Tilling and loosening the soil
- Removing weeds
- Scraping soil

Components of a plough:

- **Ploughshare:** A triangular iron blade
- **Plough Shaft:** The main part, typically made from a wooden log
- **Handle:** Found at one end of the shaft
- **Beam:** Connects to the other end of the shaft and rests on the bull's neck

Operation:

- Traditional wooden ploughs are operated by a pair of oxen and a person
- Modern iron ploughs are increasingly replacing wooden ones

Hoe:

A hoe is a gardening tool designed for:

- Digging up soil to remove weeds
- Loosening the soil to prepare it for planting saplings
- Breaking up compacted soil and aerating it to improve plant growth

Cultivator:

- A cultivator is a tool attached to a tractor that aids in loosening the soil.
- Unlike ploughs, cultivators operate more quickly, making them a preferred choice for many farmers.
- They are designed to efficiently prepare the soil by breaking up compacted layers and mixing in organic matter, which enhances soil aeration and improves overall soil health.

Traditional Tool:

The traditional tool for sowing seeds looks like a funnel. Seeds are put into the funnel, which then flows down through a few pipes with sharp tips. These tips poke into the soil and drop the seeds in.

Seed Drill:

- Used with tractors for sowing seeds.
- Ensure seeds are distributed evenly across the field.
- Control the depth at which seeds are planted.
- Cover the seeds with soil after they are sown, improving seed-to-soil contact and promoting germination.
- Increase efficiency and accuracy compared to manual sowing methods.

Adding Manure and Fertilisers

Manure:

- Natural material made from decomposed plant and animal waste.

- Enriches the soil with essential nutrients.
- Improves soil structure and helps retain moisture.
- Usually added to the soil before planting.

Fertilisers:

- Chemical substances that provide specific nutrients to plants, such as nitrogen, phosphorus, and potassium.
- Boost plant growth and increase crop yields.
- Can be added to the soil in various forms, like granules or liquids.
- Often used in combination with manure to ensure plants get a balanced supply of nutrients.

Adding both manure and fertilisers helps create a healthy environment for crops to grow, leading to better and more abundant harvests.

Crop Rotation:

- Prevents planting the same crop in the same field year after year, which can deplete soil nutrients and reduce soil fertility.
- Involves alternating different types of crops in a sequence.
- Different crops have varying nutrient needs and contribute differently to soil health.
- Helps replenish essential nutrients in the soil and can reduce the risk of soil erosion.
- Enhances soil structure and fertility by allowing different plants to restore and balance soil nutrients over time.

Difference Between manure and Fertiliser:

Manure	Fertiliser
Natural, made from decomposed plant and animal waste	Chemical substances or compounds
Provides a wide range of nutrients including organic matter	Provides specific nutrients like nitrogen, phosphorus, and potassium
Improves soil structure, increases moisture retention	Directly supplies essential nutrients, can sometimes alter soil pH
Typically applied before planting, can be used in large quantities	Applied as needed, often in smaller, measured amounts
Takes time to decompose and release nutrients	Nutrients are available to plants more quickly
Generally eco-friendly, can improve soil health	Overuse can lead to soil degradation and pollution

Advantages of Manure:

Nutrient-Rich: Provides a broad range of essential nutrients that support plant growth, including nitrogen, phosphorus, and potassium.

Soil Structure: Improves soil texture by increasing its ability to retain moisture and enhancing drainage.

Organic Matter: Adds organic matter to the soil, which helps in forming a healthy, fertile soil structure.

Microbial Activity: Boosts the activity of beneficial microorganisms in the soil, which helps in nutrient breakdown and availability.

Sustainability: Uses natural waste products, reducing the need for synthetic fertilizers and minimising waste.

Erosion Control: Helps in reducing soil erosion by improving soil cohesion and structure.

Soil Health: Enhances overall soil health and fertility over time, promoting better crop yields and sustainability.

Irrigation:

Purpose: Irrigation ensures that crops receive enough water, especially when there isn't enough rain.

Methods: There are different ways to irrigate crops, such as using pipes, channels, or sprinklers to deliver water directly to the fields.

Benefits: Helps in maintaining soil moisture, promotes healthy plant growth, and increases crop yields.

Types of Irrigation:

- Surface Irrigation: Water flows over the surface of the field.
- Drip Irrigation: Delivers water directly to the roots of plants in small amounts.
- Sprinkler Irrigation: Water is sprayed over the crops like rain.

Irrigation Systems:

A. Moat, Chain Pump, Dheki, Rahat are all traditional irrigation methods.

B. Sprinkler systems and drip irrigation are two modern irrigation methods.

Sources of irrigation:

Rivers: Water is taken from rivers and channelled to fields through canals or pipes.

Lakes: Water stored in lakes can be used to irrigate crops by drawing it out through pipes or canals.

Dams: Large structures built across rivers to store water. The stored water is then used for irrigation when needed.

Wells: Holes dug into the ground to access underground water. The water is pumped out and used for watering crops.

Rainwater Harvesting: Collecting and storing rainwater in tanks or reservoirs to use later for irrigation.

Traditional Methods of Irrigation:

Canals:

- Man-made channels that carry water from rivers or lakes to fields.
- Water flows through these channels to reach the crops.

Wells:

- Holes dug into the ground to access underground water.
- Water is lifted out using buckets or mechanical pumps and directed to the fields.

Treadle Pumps:

- Simple pumps operated by foot pedals.

- Used to lift water from wells and direct it to the crops.

Dugout Pits:

- Shallow pits or ditches dug in the ground to collect and store rainwater.
- Water from these pits is used for irrigation during dry periods.

Surface Irrigation:

- Water is spread over the surface of the field, allowing it to seep into the soil.
- Methods include furrows, basins, or flooding the fields.

Modern Methods of Irrigation:

Drip Irrigation:

- Delivers water directly to the roots of plants through small tubes and pipes.
- Reduces water wastage by providing a precise amount of water.

Sprinkler Irrigation:

- Water is sprayed over the crops like rain using a system of pipes and sprinklers.
- Covers large areas and is useful for fields with uneven terrain.

Subsurface Irrigation:

- Water is delivered below the soil surface through a network of pipes.
- Helps in conserving water and reducing evaporation.

Pivot Irrigation:

- A rotating sprinkler system mounted on wheeled towers.

- Water is sprayed in a circular pattern, covering large fields efficiently.

Rain Guns:

- Large sprinklers that shoot water over a wide area.
- Ideal for large fields and can be moved to different locations.

Weed Control or Protection from Weeds: Weeding is the process of removing undesired and uncultivated plants known as weeds.

- Harvesting is the process of manually or mechanically cutting the mature crop.
- Storage to keep grains safe from pests and bacteria must be stored properly. Foodgrains are usually harvested with more moisture than is required for storage. To keep grains safe from pests like rodents and insects, they are stored in silos and granaries on a large scale. Jute bags or metal bins are used by farmers to store crops.
- Food is also obtained from animals that have been bred for the purpose of providing food. Animal husbandry is the term for this.

Harvesting: Harvesting is done when crops are fully ripe and ready to be collected. This ensures that the crops have reached their maximum size and nutritional value.

Methods:

- **Manual Harvesting:** Crops are collected by hand using tools like sickles or knives. This is commonly used for smaller fields or crops that are delicate.
- **Mechanical Harvesting:** Machines called harvesters are used to cut, gather, and sometimes even process the crops. This method is efficient for large fields and reduces the amount of labour needed.

Threshing: It is used to remove the grain or seeds from the stalks and husks after harvesting.

Methods:

- **Manual Threshing:**

- Done by hand using tools like sticks or by beating the harvested crop on a hard surface.
- Common in small-scale farming or with crops that are harvested in small quantities.

- **Mechanical Threshing:**

- Uses machines called threshers or combine harvesters.
- These machines separate the grains from the stalks quickly and efficiently, making it suitable for large-scale farming.

Winnowing: To remove the lighter chaff and impurities from the heavier grains, making the grains clean and ready for storage or sale.

Methods:

- **Manual Winnowing:**

- Involves tossing the mixture of grain and chaff into the air.
- The wind helps blow away the lighter chaff, while the heavier grains fall back down.
- Often done using a flat basket or tray.

- **Mechanical Winnowing:**

- Uses machines to separate the grain from the chaff more quickly.
- Machines use air blowers and sieves to achieve the separation efficiently.

Storage:

- To protect harvested crops from damage, pests, and spoilage.
- To maintain the quality and quantity of the crops over time.

Methods of Storage:

- **Traditional Storage:**

- Granaries: Raised structures with ventilation to keep crops like grains dry and safe from pests.
- Storage Bins: Containers made of materials like bamboo or mud, often used for storing small quantities of crops.
- Jute Bags: Bags made of jute fibre used for storing grains, often kept in a cool, dry place.

- **Modern Storage:**

- Silos: Large, cylindrical structures made of metal or concrete for bulk storage of grains. They are designed to keep the crops dry and protect them from pests.
- Cold Storage: Refrigerated storage facilities used for perishable items like fruits and vegetables to keep them fresh for longer periods.
- Pest Control: Use of chemicals or traps to prevent pest infestation in storage areas.

Animal Husbandry: To ensure the health and productivity of animals raised for various purposes such as milk, meat, wool, and labour.

Key Aspects of Animal Husbandry:

- **Feeding:**

- Providing animals with the right type and amount of food to meet their nutritional needs.
- Includes providing balanced diets with necessary nutrients for growth, milk production, or work.
- **Breeding:**
 - Selecting and mating animals to produce offspring with desired traits.
 - Aims to improve the quality and productivity of livestock.
- **Health Care:**
 - Regular health checks and vaccinations to prevent diseases.
 - Providing treatment for illnesses and maintaining overall hygiene.
- **Housing:**
 - Providing appropriate shelter to protect animals from harsh weather and predators.
 - Ensuring clean and comfortable living conditions to promote health and productivity.
- **Management:**
 - Keeping records of the animals, including their breeding, health, and production.
 - Managing their daily activities and ensuring their well-being.