Chapter- 1 Crop Production and Management

Agricultural Practices

Basic Practices of Crop Production

Manure and Fertilizers

Irrigation

Protection from Weeds

Harvesting

Storage

Agricultural Practices

We require food to carry out various metabolic functions of the body. In order to fulfill the demand of food for a large number of population regular production, proper management and distribution of food is necessary. **Crop** is a cultivated plant that is grown on a large scale commercially, especially a cereal, fruit, or vegetable. For example, crop of wheat means that all the plants grown in a field are that of wheat. Agriculture is the science, art, or practice of cultivating the soil, producing crops, and raising livestock and in varying degrees the preparation and marketing of the resulting products.

Crop field

According to the climatic conditions of a particular region the cropping patterns can be categorized into

a. **Kharif crops**
b. **Rabi crop**

Kharif crop

Kharif crops - The crops which are sown in the rainy season are called kharif crops. Paddy, maize, soyabean, groundnut, cotton, etc., are kharif crops.

Rabi crop - The crops grown in the winter season are called rabi crops. Examples of rabi crops are wheat, gram, pea, mustard and linseed.

Basic Practices of Crop Production

Soil may be defined as the upper thin layer of earth's crust, which serves as a natural medium for the growth of plants. Crop production involves a number of activities. These activities which a farmer performs to cultivate a crop are referred as agricultural practice.

These activities are listed below.

- **Preparation of soil**
- **Sowing**
- **Adding manure and fertilisers**
- **Irrigation**
- **Protecting from weeds**
- **Harvesting**
- **Storage**

Preparation of Soil

Preparation of soil is the first step in cultivating a crop for food production. The soil is prepared for sowing the seeds of the crop, by ploughing, leveling and manuring.

Before crops are planted, the soil must be prepared. It is done by turning and loosening the soil and this process is known as ploughing or tilling. Ploughing helps in easy penetration of the roots of seedlings. It aerates the soil thus the roots can thus breathe easily. It helps in the growth of earthworms and microbes present in the soil. These organisms further turn and loosen the soil and also add humus to the soil. The weeds are uprooted. This is done by using some devices known as agricultural implements.

Ploughing

Agricultural Implements

The main tools used for this purpose are the plough, hoe, cultivator, and leveller.

Plough: It is a wooden or metal device drawn by a pair of bulls or other animals. It contains a strong triangular iron strip called ploughshare. The main part of the plough

is a long log of wood which is called a ploughshaft. There is a handle at one end of the shaft. The other end is attached to a beam which is placed on the bull's necks.

Hoe: It is used for loosening the soil as well as for removing the weeds. It consists of a long rod of wood or iron. At one of the ends, a strong, broad and bent plate of iron is fixed. It has a long rod of wood or iron. A strong, broad and bent plate of iron is fixed to one of its ends and works like a blade.

Cultivator: These are driven by tractors. It is unlike the conventional plough. It saves time and labour. Cultivators stir and pulverize the soil before planting to aerate the soil and to prepare a smooth, loose seedbed.

Leveller: It is a large piece of wooden plank, which can also be driven by animals or a tractor.

Cultivator

Sowing

Healthy seeds of good quality and good variety should be chosen to sow

There are different tools for this purpose.

Traditional Tool: In this tool, seeds are filled into a funnel, passed down through a pipe having sharp end. This end pierce into the soil and is placed there.

Seed Drill: This tool sows the seeds uniformly at proper distances and depths. It ensures that seeds get covered by the soil after sowing.

Selection of Seeds

The seeds that are not damaged will be hollow and thus would float on water unlike the healthy seeds. Healthy seeds can be selected and allowed to be sown.

Adding Manure and Fertilizers

Manure is a natural substance obtained by the decomposition of cattle dung, human waste and plant residues. It is rich in nutrients and added to the soil for the healthy growth of plants.

Functions of manure

- They improve the texture of the soil.
- They increase the water holding capacity of the soil.
- They make the soil porous due to which exchange of gases in the soil improves.
- It increases the number of friendly soil organisms like earthworms and microbes.


Fertilizers added to soil

Another method of replenishing the soil with nutrients is through crop rotation. This can be done by growing different crops alternatively like growing legumes for one season then wheat for another. Thus the nitrogen is replenished back to the soil. This is done by the *Rhizobium* bacteria.

Fertilizers are inorganic nutrients that are added to the soil to make it fertile.

Difference between manure and fertilizers

Fertilizers	Manure
A fertilizer is prepared in factories.	Manure can be prepared in the fields.
A fertilizer does not provide any humus to the soil.	Manure provides a lot of humus to the soil.
Fertilizers are very rich in nutrients like nitrogen phosphorus and potassium.	Manure is relatively less rich in plant nutrients.

Irrigation

Irrigation is the supply of water to the land from artificial channels to make plants grow. In many dry parts of the world where there is not enough rainfall, farmers irrigate their land to grow crops. Even in places where there is good rainfall, farmers often use irrigation to boost the growth of their crops. Irrigation makes agriculture possible in areas previously unsuitable for intensive crop production. Irrigation transports water to crops to increase yield, keep crops cool under excessive heat conditions and prevent freezing

The aim of irrigation is to spread the water evenly across the land so that each plant gets the same amount of water it needs. Many different methods of irrigation are now in use.

There are two ways of Irrigation

- Traditional ways
- Modern ways

Traditional ways of Irrigation

Pumps are commonly used for lifting water. Diesel, biogas, electricity and solar energy is used to run these pumps.

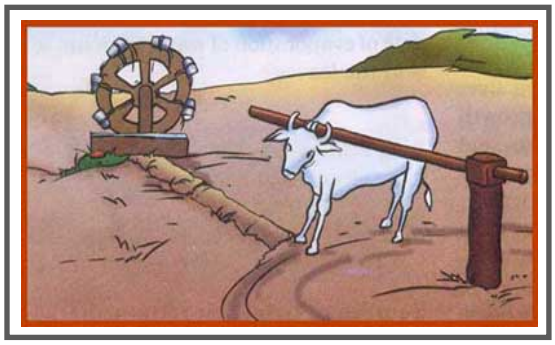
Cattle or human labour is used in these methods. So these methods are cheaper, but less efficient.

(i) **Moat** (pulley-system) – The water is filled in the pot from the well and poured on the crops.

(ii) **Chain pump** - The chain system involves irrigating fields with the help of water filled bucket.

(iii) *Dhekli* – The water is derived from the well and poured in the field.

(iv) *Rahat* (Lever system) – *Rahat* involves the use of an animal to irrigate the fields. The wheel turns and water filled buckets allow the water to spread over the field.



Rahat **(Lever system)**

Modern ways

Drip irrigation - Another method of irrigation is drip irrigation. Water is pumped through pipes and fed to plants near the roots, drop by drop. This is a very efficient method of watering plants because evaporation and run-off are kept to a minimum.

Sprinklers - Sprinklers are used in another kind of irrigation. Water is pumped to places in the fields where large sprinklers rotate and spray water at high pressure over the crops. When water is allowed to flow through the main pipe under pressure with the help of a pump, it escapes from the rotating nozzles. It gets sprinkled on the crop as if it is raining. Sprinkler is very useful for sandy soil.

Sprinklers

Protection from Weeds

Weeds are the undesirable plants growing along with the crop plant. These weeds need to be removed as they would take up the nutrients from the soil that is required by the crops. The removal of weeds is called weeding. The best time for the removal of weeds is before they produce flowers and seeds.

It can be done

- By hands – Mechanically removing the weeds with hands.
- By using trowel - A hand tool with a short handle and a curved tapering blade used for removing weeds.
- By a tractor driven harrow – A harrow is attached to the tractor that removes the weeds as the tractor moves.
- By Chemicals – Weedicides are chemicals sprayed to the fields to kill the weeds.
- They are diluted with water and do not harm the crops. For example 2,4-D.

Weeding

Harvesting

The cutting of crop after it is mature is called harvesting. Harvesting includes several steps: gathering of the harvest, delivery for processing, transportation of the processed material for sale, and storage. The primary stage in crop harvesting consists of two groups of tasks: removal of the bulk plant material (cutting grains and grasses, digging up tubers, pulling flax, and gathering fruits and berries) and subsequent processing.

Harvesting of crops

The harvesting method used depends on the biological characteristics of the crop, climatic conditions, and the technical equipment available. Crops are pulled out or cut close to the ground by using sickle or machines. Then the seeds get separated from its chaff that is called Threshing. Farmers with small holdings of land do the separation of grain and chaff by winnowing.

Storage

If freshly harvested grains (seeds) are stored without drying, they may get spoilt or attacked by organisms, losing their germination capacity. Hence, before storing them, the grains are properly dried in the sun to reduce the moisture in them. This prevents the attack by insect pests, bacteria and fungi. Then grains are sent to be stored in granaries after being dried in the sun. For storing large quantities of grains in big godowns, specific chemical treatments are required to protect them from pests and microorganisms. Large scale storage of grains is done in **SILOS**.

Food from Animals

Like the crops the animals are also reared at home or in farms. They have to be provided with proper food, shelter and care. When this is done on a large scale, it is called **animal husbandry**.