1.1 CROPS

When the same kind of plants are grown in the fields on a large scale to obtain foods like cereals, pulses, vegetables and fruits etc., it is called a crop.

Crops are classified on the basis of the seasons as given below:

KHARIF CROPS	RABI CROPS
Kharif crops are grown during the monsoon (rainy) season (June- September).	Rabi crops are grown during the winter season (October-March)
Seeds of these crops are sown in the beginning of the monsoon season.	Seeds of these crops are sown in the beginning of the winter season.
These crops are harvested at the end of the monsoon season (Oct.-Nov.)	These crops are harvested at the end of the winter season (April-May).
For example, maize, millet (bajra) and cotton crops.	For example, wheat, gram and mustard

1.2 Basic Practices of Crop Production

1.3 PREPARATION OF SOIL

Before sowing the crop seeds, the soil of fields is loosened and turned over. This process is called ploughing or tilling. Ploughing causes ventilation of soil and makes it suitable for the growth of small organisms living in it. Implement used for ploughing is a plough, hoe, sickle and cultivator.

1.3.1 Plough

A large farming implement with one or more blades fixed in a frame, used to turn over and cut furrows in soil, is called plough. Plough may be made of only wood, wood and iron, and of iron only. The plough consists of long log of wood which is called plough shaft. There is a handle at one end of the plough shaft. Below the handle is a strong triangular iron strip called ploughshare. Ploughshare is main.

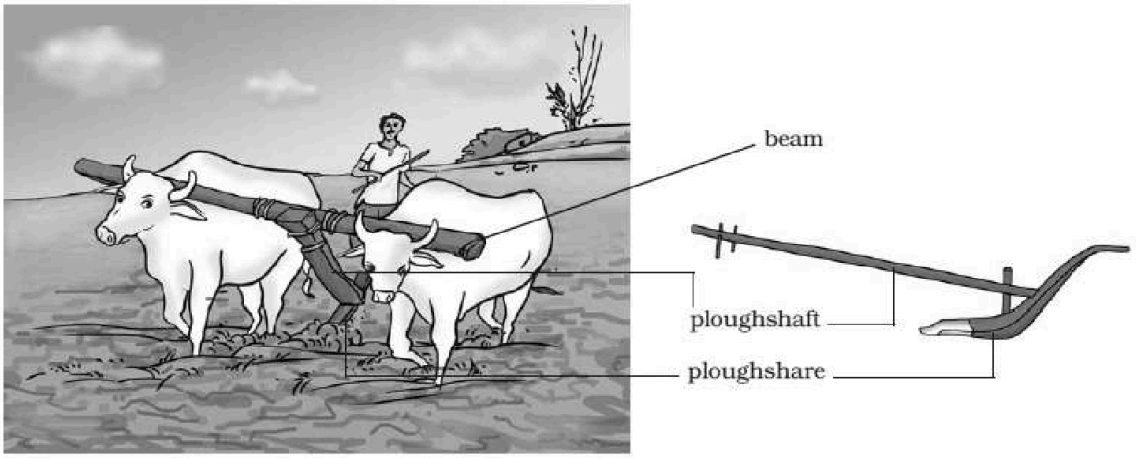


Fig. 1.1 (a) : The plough

1.3.2 Hoe

It is a tool used for removing weeds and for loosening the soil.

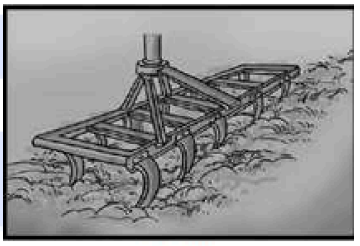
1.3.3 Sickle

It is a tool used for loosening the soil, cutting of grass and harvesting.

1.3.4 Cultivator

Nowadays ploughing is done by a tractor driven cultivator. The use of cultivator saves labour and time.

1.4 SOWING OF SEEDS



Seed Drill

For sowing, farmers obtain certified seeds from State Agriculture Department and Seed Corporation. Sometimes, farmers also select seeds from their own crop.

1.4.1 Selection of seeds

For most of the crops, seeds are put into a bucket of water. The seeds which float on water are rejected. These seeds are defective. The seeds which remain submerged in water are selected for sowing.

1.4.2 Sowing of seeds

Seeds are sown either by hand-broadcasting (spreading) or by Seed Drills. A type of seed drill, commonly used, is a long iron pipe having a funnel at the top. It is tied at the back of the plough.

A farmer does ploughing and simultaneously releases seeds from the funnel. Seeds thus released pass through iron pipe to the soil furrows which are formed by the plough.

1.5 ADDING MANURE AND FERTILISERS

Like other plants, crops also obtain their mineral nutrients from the soil. Soil fertility is improved by adding manure or fertilizers.

1.5.1 Manure

Continuous growing of crop in the field causes deficiency of mineral nutrients in the soil. So, manure is added to the soil to make up the deficiency of mineral nutrients. This process is called manuring. Manure is prepared from cow dung, urine and other wastes.

1.5.2 Fertilizers

Sometimes, soil becomes deficient in particular mineral nutrients. This happens when same crop is grown in the same field year after year. This type of deficiency of a particular nutrient is made up by adding chemical substances called fertilizers. For example: Urea, Super phosphate and NPK (Nitrogen, Phosphorus, and Potassium).

1.5.3 Natural method of increasing soil fertility

1.5.3.1 Fallow Field

The method of allowing the soil to regenerate the lost nutrient by leaving the field uncultivated (or fallow) for one or more seasons. The decomposition of dead plants and animals, animal wastes on the land replenishes the lost nutrients.

1.5.3.2 Crop rotation

Process of growing two different crops, alternating with each other in same field in successive seasons, so that the land is not drained of any one nutrient is known as crop rotation. Cereal crops are grown alternating with legumes.

1.5.4 Difference between Manures and Fertilizers

Manures	Fertilizers
They are organic substances obtained by the decomposition of animal waste and plant residues by microbes.	They are generally inorganic chemical compounds manufactured in factories.
They are relatively bulky or voluminous. Hence, they are not easy to store, transport or apply to soil.	They are compact. Hence, they are easy to store, transport and apply to soil.
They are not nutrient specific. They provide several nutrients in small quantities.	They are nutrient specific and hence can provide specifically one or more of the nutrients.
They are absorbed slowly by the plants because they are not much soluble in water.	They are readily absorbed by plants as they are soluble in water.
They provide a lot of organic matter (humus) to the soil and improve the texture of soil.	They do not provide humus to the soil.
They are comparatively cheap as they can be made in the fields.	They are far more expensive and have to be brought to the fields from factories.
They bind to the soil and do not get washed off easily.	They don't bind to the soil and get washed off to lakes, rivers where they contaminate the water.
These are biodegradable.	These are non-biodegradable

1.6 IRRIGATION

The supply of water to crops at different intervals is called irrigation. The time and frequency of irrigation varies from crop to crop, soil to soil and season to season.

Methods of Irrigation:

- Traditional methods: Moat (pulley-system), Chain pump, Dhekli, Rahat
- Modern methods: Sprinkler system, Drip system

1.7 PROTECTION FROM WEED

- The unwanted plants growing in the fields are called weeds.
- Seeds of these weeds spread through air, water, birds and other animals.
- Weeds share water, sunlight, space, nutrients with the crop plants. Their removal is necessary as they compete with the crop plants.
- Weeds are removed during vegetative phase i.e. before flowering to prevent their propagation.

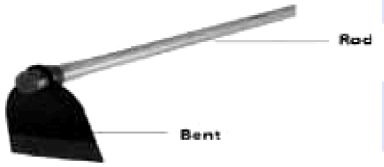
Methods of weeding:

(a) Manual

It can be best done by tilling, which helps in uprooting the crops.

- Weeds should be removed before formation of flowers and seeds, as seeds can germinate to form more number of weeds.
- It is also performed manually by ***Khurpi and Spade***.

Sickle



Spade

(b) Chemical method

By spraying chemical substances called weedicides which kill the weeds. Eg- 2, 4-D

1.8 HARVESTING

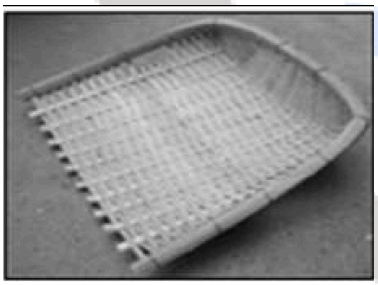
- When crops get matured, they usually turn yellow or golden or brown. This is the time when crops should be cut. ***Cutting of mature crops is known as harvesting.***
- Harvesting is either done manually by a Sickle or by a machine called Harvester.
- Harvested crop is further dried and then animals such as bullocks, buffaloes, camels are made to walk over it to separate the grains from harvested crop. This process of separation using a physical force is known as **threshing**.
- Some farmers use huge machines known as **Combine** which do both harvesting and threshing.
- The process of separation of the grains from chaff with the help of wind force is known as **winnowing.**

Special festivals associated with the harvest seasons are: Pongal, Baishakhi, Holi, Diwali, Nabanya and Bihu.

Harvesting

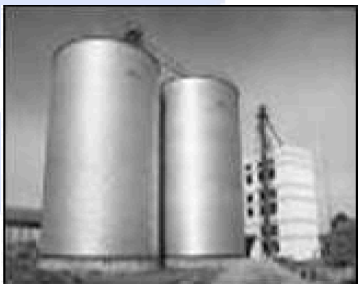
Threshing

Combine



Winnowing fan

Winnowing



Silos

1.9 STORAGE

- Storage of the agricultural product is important to maintain a buffer stock, as insurance against calamities, for transportation and uniform distribution for longer period of time.
- During storage, grains are **protected against the attack of different pests and microorganisms.**
- Grains are stored in huge bags or metallic bins. Large amounts of grains are stored in

Granaries (small boxes used to store grains) and Silos.

- The growth of microorganisms like fungus and mould on grains is promoted with increase in moisture, humidity and temperature.
- Dry and nonperishable produce are stored at room temperature whereas perishable items, like fruits require cold storage where the temperature is maintained between 00°C and 40°C.
- Grains can be prevented from getting spoilt in following ways:
  - Excess moisture is removed by drying grains in sun before storage
  - Grains are kept at a low temperature for preventing the growth of microorganisms.
  - Sometimes pesticides are used to avoid pest attack.
  - Storage should be done in clean, dry and cool containers that do not react with the grains.
  - Dried neem leaves are also used for storing food grains at home.
  - Grains obtained by threshing are dried in the open. The dried grains are stored in gunny bags, and placed in properly ventilated cemented halls, known as **Godowns**
  - Farmers keep dried grains in jute bags or metallic bins or mud bins.
  - For storing large quantities of grains in big Godowns, specific chemical treatments are used to protect them from pests and microorganisms.

1.10 ANIMAL HUSBANDARY

Food is also obtained from animals for which animals are reared and provided with proper food, shelter and care. When done on a large scale, it is called animal husbandry.

Important components of Animal Husbandry are as follows:

(i) Proper feeding and providing clean drinking water.

(ii) Clean and ventilated shelter.

(iii) Prevention and care of animal diseases from spreading.

(iv) Proper breeding of animals.

1.11 FOOD PRODUCTION FROM ANIMALS

(i) Dairy animals: Milk giving or Milch animals

(ii) Draught animals or working animals

(iii) Poultry animals: Meat & Egg giving animals

(iv) Fish farming: Fish and other aquatic animals

(v) Fiber, skin and other useful products yielding animals

1.12 FACTS

(i) Farmers often plant tall, dense trees on the edges of fruit farms. These trees provide a windbreak, which helps prevent soil erosion.

(ii) A cash crop is an agricultural crop which is grown for commercial purposes. E.g. Cotton, Tobacco, Turmeric, Sugarcane, Cashew nut.

(iii) Transplantation: In some crops like tomatoes, chillies and paddy the seeds are first sown in special nurseries. They germinate to produce seedlings which are planted in proper fields manually.

(iv) The weedicides are harmful for human beings and are being replaced by herbicides which are prepared from plants.

(v) Pesticides stick to fruits and leaves. It is therefore advisable to wash them thoroughly before using them.

(vi) The food grains to be stored should not contain more than 9% moisture by weight.

Pioneers of Green Revolution

Father of White Revolution

NORMAN BORLAUG **Prof M S SWAMINATHAN** **Dr. KURIEN VERGHESE**

1.13 ACTIVITY

SELECTION OF GOOD QUALITY SEEDS.

Aim: To select good and healthy seeds for sowing

Materials Required- Seeds, Bucket containing water.

Method- We can select good, healthy seeds for sowing as follows:

- Put all the seeds in bucket containing water and stir well.
- Most of the seeds will settle down at the bottom whereas some seeds will float on top.

Observation: Most of the seeds sink whereas few of them float in water.

Conclusion:

- The seeds which sink at the bottom of the bucket are the healthy seeds. Healthy seeds are heavy, so they sink in water
- On the other hand, the seeds which float on water are the spoiled seeds. The seeds which have been partially eaten by pests or damaged become hollow and light, and hence float on water.