

# Food Production and its Management

## Food Production

Living organisms require food for growth and survival. Plants are known to prepare their own food while animals obtain their food from plants. In order to provide food for a large population, regular production, proper management and distribution of food is necessary.

### Crops

When plants of same type are grown and cultivated in a field at large scale. It is called a crop, and the pattern of growing such crops is called **cropping pattern**, e.g. wheat crop, paddy crop, etc.

The two broad cropping patterns are

#### (i) Kharif Crops

The crops that are sown in rainy season are called kharif crops or summer crops. These are sown in June-July and harvested at the end of monsoon season, i.e. during September, e.g. paddy (rice), maize, soybean, cotton, groundnut, millets, etc.

#### (ii) Rabi Crops

- The crops that are grown in winter season are called rabi crops or winter crops. These are sown during October-November and harvested by March, e.g. wheat, gram, pea, mustard and linseed.
- This categorisation is based upon the season in which a crop is grown.
- Cultivation of crops involves several activities undertaken by farmers over a period of time. These activities or tasks are referred to as agricultural practices. These are as follows.

## Agricultural Practices

The agricultural practices are done by using various tools. These tools are called agricultural implements. These include

1. **Plough** It is the most ancient tool used for tilling the soil, adding manures, removing weeds, etc.

It comprises of a strong triangular iron strip called ploughshare. Its main part is a long log of wood with a handle at one end and a beam on other hand.

2. **Hoe** It is used for removing weeds and for loosening soil. It is simple in structure with a long rod of wood or iron with a broad, bent and strong iron plate at one of its end which works like a blade.
3. **Cultivator** It is a modern form of plough which can dig into a considerable area of soil at the same time.

## Basic Agricultural Practices of Crop Production

- The various agricultural practices of crop production involves.
- Preparation of soil
- Sowing                      • Adding manure and fertilisers
- Irrigation                • Protection from weeds
- Harvesting              • Storage

### Preparation of Soil

Soil is prepared for sowing seeds by three major methods

#### (i) Ploughing

- The process of loosening and turning the soil is called ploughing or tilling. It is done by using a plough.
- It is beneficial as it helps the roots to penetrate deeper in the soil, breathe easily, removes weeds. It turns the soil to enrich it with nutrients.

#### (ii) Levelling

- The ploughed soil becomes loose, therefore to prevent soil erosion, the ploughed soil is levelled by pressing it with a wooden or iron leveller.
- Levelling helps to break crumbs with a planks and prevents loss of moisture from the loose soil.

#### (iii) Adding Manure and Fertilisers

- Manure and fertilisers are the substances that are rich in nutrients and are added to the soil for healthy growth of plants.
- **Manures** are organic substances derived from the decomposition of plant and animal wastes like cow dung, urine, etc .Plant and animal

wastes are dumped in pits at open places and allowed it to decompose by some microorganisms. The decomposed matter is used as organic manure.

- The chemical fertilisers have a particular plant nutrient in concentrated form and provide quick nourishment of that plant nutrient. These are easily soluble in water and easily absorbable by the plants. The excessive use of fertiliser is harmful because it makes the soil acidic or alkaline (*i.e.* less fertile) and also causes water pollution.

### Irrigation

- Water is important for proper growth and development of flowers, fruits and seeds of plant. The process of supplying water to crops at different intervals is called irrigation. The frequency and time of irrigation differ from crop to crop, soil to soil and season to season.
- Water is absorbed by the plant roots along with minerals and fertilisers. Water is essential because germination of seeds does not take place under dry conditions. Water also protects the crop from both frost and hot air currents.

### Protection from Weeds

- While the plants are grown in the field, many small, unwanted plants also germinate and grow in the field along with the crop plant. These unwanted, wild plants that grow along with the cultivated crops are called **weeds**. The removal of weeds from the field is called **weeding**.
- Some of the common weeds that are found in wheat and rice fields are wild oat, grass, *Amaranthus* or chaulai and *Chenopodium* or bathua. Types of weeds vary from field-to-field or crop to crop or even from season-to-season.

### Use of Weedicides

- These are the chemicals which kill the weeds in agriculture/horticulture. Weeds are the unwanted plants.
- They are commonly biodegradable but have long term effect on the ecology.

- Herbicides are prepared from urea derivatives triazines, e.g. atrazine, simazine, etc.

### Biological Methods of Pest Control

*Due to the harmful effects of synthetic pesticides, some biopesticides are introduced.*

*Biopesticides are the living organisms that are used to kill the pests without any harmful effects on ecology.*

*Some of the biopesticides are – bioherbicides and bioinsecticides.*

#### (i) Bioherbicides

*Bioherbicides are used for biological control of weeds. It includes use of insects which would feed selectively on weeds and use of certain pathogenic micro organisms on weeds.*

*The first bioherbicide was mycoherbicide, based on the fungus *Phytophthora palmivora*. It was developed in 1981.*

#### (ii) Bioinsecticides

*It includes pathogen, parasites and predators, insect hormones, natural insecticides and sterilisation strategies.*

*Predators, which consume insects are bio pesticides and these are frogs, fisher, snakes, etc.*

*Some of the natural insecticides are nicotine, azadiractin, obtained from tobacco and neem.*

### Harvesting

When crops get matured, they are cut and gathered. This process is called crop harvesting. It occurs in following steps.

- (i) Crop is harvested by pulling it out or by cutting it close to the ground. It is either done manually by sickle or by a machine called **harvester**.
- (ii) After that grain seeds are separated from the chaff. It is called **threshing**. This is carried out with the help of a machine called **combine** which is a combination of harvester and thresher.
- (iii) Then the grains are separated from chaff by the process called winnowing.

### Storage

Since the crops/grains have to be kept for longer time, they should be safe from moisture, insects, microorganisms, etc.

- Therefore the harvested and cleaned gains are first dried to evaporate moisture.
- It is followed by spraying of insecticides and rodenticides to protect it from rats and insects.
- After that, the grains are stored in jute bags or metallic bins. At large scale, grains are stored in silos and granaries to protect them from pests.
- The big containers that are used for the storage of grains in large quantities are called silos. They protect the stored grains from pests and insects.
- The food grains are bought from the farmers by the Government Agencies like Food Corporation of India (FCI) and stored in its godown.

# Practice Exercise

1. Out of the following groups of crops which group is included in Kharif crops?  
(a) Rice, wheat, cotton  
(b) Maize, soyabean, mustard  
(c) Rice, Mustard, cotton  
(d) Rice, maize, soyabean
2. Which of the following tools would a farmer use to remove weeds from the field?  
(a) Hoe (b) Plough  
(c) Axe (d) Cultivator
3. The process of loosening and turning of soil is called  
(a) irrigation and manuring  
(b) digging and winnowing  
(c) tilling and ploughing  
(d) harvesting and storage
4. The monsoon season in our country is during the months.  
(a) April-December (b) June-September  
(c) November-March (d) January- May
5. Which of the following statements is not true for organic manure?  
(a) It enhances water holding capacity of soil  
(b) It has a balance of all plant nutrients  
(c) It provides humus to soil  
(d) It improves texture of soil
6. Watering the crops is called  
(a) sowing (b) manuring  
(c) tilling (d) irrigation
7. The term used for the process of separation of grains from chaff is  
(a) sieving (b) winnowing  
(c) threshing (d) hand picking
8. Weeds are the  
(a) main crops plants  
(b) insects and pests  
(c) unwanted plants growing along the crop  
(d) chemical substances
9. Seed drill is used to  
(a) sow the seeds  
(b) remove the weeds  
(c) remove the pest  
(d) mix manure in the soil
10. Which one of the following conditions is not essential to grow maize?  
(a) High temperature (b) Humidity  
(c) Low temperature (d) Rainfall
11. 2, 4-D is a  
(a) pesticides (b) insecticides  
(c) fungicides (d) weedicides
12. Given below are statements about the harmful effects of weeds on crop plants.  
(i) They interfere in harvesting.  
(ii) They help crop plants to grow healthily.  
(iii) They compete with crop plants for water, nutrients, space and light.  
(iv) They affect the plant growth.  
Choose the correct combination of statements.  
(a) (i), (iii) and (iv) (b) Only (iii)  
(c) (iii) and (iv) (d) (i), (ii), (iii) and (iv)
13. Planting of seeds is called  
(a) cultivation (b) irrigation  
(c) harvesting (d) sowing
14. Which of the following is not true for fertilisers ?  
(a) They increase the yield  
(b) Their excessive use disturbs the balance of nutrients in soil  
(c) They are generally used in small quantity  
(d) They are environment friendly
15. The term used for the process of separation of grains from chaff is  
(a) sieving  
(b) winnowing  
(c) threshing  
(d) hand picking

- # Answers

[illegible]