

1 Food Production

Answers to Exercises

1. The practice of growing crops is called agriculture (*ager* means 'field' in Latin, while *culture* means cultivation).
 2. Rubber and coffee are two examples of plantation crops.
 3. The major activities involved in growing a crop are preparing the soil, which includes ploughing, levelling and manuring, sowing seeds, irrigating the fields and protecting the crops.
 4. The unwanted plants which grow along with crops are called weeds. They compete with the crops for light, water, space and minerals, and harm the growth and yield.
 5. Weeds can be removed manually or by using an implement like a trowel, hoe or rake. A third way of getting rid of weeds is by spraying chemicals called weedicides.
 6. Pests like rodents (rats) and insects often eat and damage crop plants and their produce. Rats eat grains and contaminate them with their excreta.
 7. Animal proteins are better than plant proteins as they are more completely digested by us. Also, they contain some essential amino acids that plant proteins lack.
 8. Kharif crops are sown during the monsoon.
 9. The rearing of animals is referred to as livestock farming or animal husbandry.
 10. Temperature and humidity are the two things that have to be controlled in a cold storage.
1. (a) Different crops have different nutrient requirements. If we grow the same crop in the same field season after season, the soil becomes deficient in the set of nutrients needed by the crop. So, it is better to grow one crop in one season and another crop in the next season. In other words, crop rotation is a good agricultural practice.
(b) Pulses are grown in alternation with nutrient-demanding crops such as wheat and paddy because they improve soil fertility.
 2. (a) Some plants (black gram, cluster bean, cowpea, etc.) are grown specially to produce manure. They are ploughed back into the soil and are referred to as green manure.
(b) Manure, or organic manure, is produced by the decomposition of crop residue, animal dung, the sludge from the treatment of sewage, and so on. When manure is produced by allowing microorganisms to act on the waste matter in covered pits or in the open, it is called compost. The process of decomposition can take place in the open too.
 3. (a) Scientists are trying to find natural or biological ways of controlling weeds and plant pests. One way is to use the natural enemies of weeds and pests to kill them. This is called the biological control of weeds and pests.
(b) Weedicides and pesticides are poisonous. They cause irritation of the human skin and respiratory system, and even cancer. Therefore, natural or biological ways of controlling weeds and plant pests is a better alternative.
 4. The swellings formed by the nitrogen-fixing bacteria in roots of leguminous plants are called root nodules. The bacteria convert nitrogen into ammonia, which the plant uses to make proteins.
 5. The modes of irrigation in which the water is allowed to run over the field fall under surface irrigation. In case of crops which do not need too much water, the crop is planted on ridges and water is allowed to run through furrows between the ridges. This is called furrow irrigation. For crops like rice, which need a lot of water, the field is flooded with water by making bunds all around it. This is called basin irrigation.

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C. 1. The advantages and disadvantages of using chemical fertilisers are as follows.

Advantages

- (i) Provide nutrients which are either absent or not present in sufficient quantities in manure.
- (ii) Easy to store, transport and use because they are compact.
- (iii) Readily absorbed by plants because they are water soluble.

Disadvantages

- (i) They do not provide humus—they change the soil structure and make it prone to erosion.
 - (ii) Overuse can harm soil fertility by making it too acidic or alkaline.
 - (iii) Accumulation of fertilisers in water bodies causes eutrophication.
2. The bacteria living in the roots of legumes, many other bacteria and cyanobacteria (bacterialike microorganisms) convert atmospheric nitrogen into compounds that plants can use. When plants and animals die, the nitrogenous compounds locked in their body are converted into ammonia by microorganisms. The ammonia is ultimately converted into nitrates by bacteria.

There is a reverse process in nature which returns nitrogen to the air. Some bacteria living in the soil break down nitrogenous compounds to get energy. The nitrogen released in the process escapes into the air.

All these processes can be summed up as a continual cycling of nitrogen from the air to the soil and to the living world. Together they form the nitrogen cycle.

3. Traditionally, farmers depended on rainfall for irrigation. Crops with a large requirement of water were grown in areas with moderate to high rainfall. Hardy crops, which can withstand a shortage of water, were grown in dry areas. Things have changed to a certain extent in modern times, with the construction of dams across rivers. Water from these dams is carried by canals to many areas which were deprived of water earlier. The dams bring water from different rivers and have made the cultivation of various crops possible. Inundation canals are used to divert rainwater from rivers and streams during the monsoon. The practice in southern India is to store rainwater in tanks.

Wells have been used to tap groundwater. Electrically-operated tubewells are used to pump out water for irrigation. Groundwater accounts for over 50% of the water used for irrigation.

- D. 1. horticulture 2. fumigation 3. buffer stock 4. symbiosis 5. depth
6. The biological or natural method 7. fallow
- E. 1. (a) 2. (d) 3. (a) 4. (b) 5. (a)
6. (c) 7. (a)
- F. 1. (a), (d) 2. (a), (b), (c) 3. (a), (c) 4. (b), (c) 5. (a), (c)

