CBSE NCERT Solutions for Class 9 Science Chapter 15

Back of Chapter Questions

1. What is genetic manipulation? How it is useful in agricultural practices?

   **Solution:**

   Genetic manipulation is the process of introducing a specific gene in the genetic composition in order to obtain the desired characteristics of a crop. Various desirable characteristics that can be achieved by genetic manipulation include:

   (i) High yield
   (ii) Improved Quality
   (iii) Wider adaptability
   (iv) Desirable agronomic traits
   (v) Biotic and abiotic resistance

2. Explain any one method of crop production which ensures high yield.

   **Solution:**

   Cropping pattern is one of the methods of crop production that ensures high yield. There are several ways of growing crops. Few of them include Mixed cropping, intercropping and crop rotation.

   (i) **Mixed cropping:**

   Cultivation of two or more crops together on the same area of the land is known as mixed cropping. For example: Cultivating wheat and mustard (or gram). This results in reduced chances of crop failure.

   (ii) **Intercropping:**

   Cultivation of two or more crops on the same area in a specific pattern is known as intercropping. Certain number of rows of one crop is alternated with certain number of rows of another crop. For example: Maize and Soya bean. This pattern is best suited to control weeds and pest along with maximum utilization of nutrients.

   (iii) **Crop rotation:**

   Cultivation of crops in same area in a predetermined succession is known as crop rotation. This pattern is best suited for maintaining the fertility of soil along with controlling pest and weed.

3. Why are manure and fertilizers used in fields?

   **Solution:**
Manure and fertilizers are utilized for increasing and improving the yield of crops.

4. What are the advantages of intercropping and crop rotation?

**Solution:**

**Advantages of Intercropping:**

(i) Two or more crops are cultivated in the same area of the field.
(ii) Decreases the changes of intraspecific competition and ensures the maximum utility of the nutrients provided.
(iii) Inhibits the spread of diseases and pests from infecting all the plants.
(iv) It helps maintain fertility of soil.

**Advantages of crop rotation:**

(i) Two or more crops are cultivated within a year.
(ii) It improves soil fertility and thus increases the yield of the crop.
(iii) There is a decrease in the need for nitrogenous fertilizers since the growing of leguminous plants helps in fixing atmospheric nitrogen, thus enriching the soil with nitrogenous compounds.
(iv) Rotation of crops help in keeping a check on pest attack on the crops, since the pests cannot attack the crops in all the seasons due to crop rotation.

5. How do storage grain losses occur?

**Solution:**

Loss of storage grains occurs due to Biotic and Abiotic factors. Biotic factors are rodents, insects, mice, fungi and bacteria while abiotic factors include moisture and temperature of storage area.

6. How do good animal husbandry practices benefit farmers?

**Solution:**

Proper management of farm animals is known as Animal husbandry which involves proper shelter, care, feeding and protection from pests and diseases. There are multiple ways in which a farmer benefits from good animal husbandry practices, they include:

(i) Protection from pests and diseases and proper shelter increases the economic values of animals.
(ii) High yield of milk, meat, egg, fur etc., which are animal products can be obtained.
(iii) High and improved animal breeds can be produced.
7. What are the benefits of cattle farming?

**Solution:**

Benefits of cattle farming include:

(i) Production of high milk yielding animals.
(ii) Production of good breed of drought animals.

8. For increasing production, what is common in poultry, fisheries and beekeeping?

**Solution:**

The common activities in poultry, fisheries and bee-keeping for increasing the production are:

(i) An improved variety is obtained by cross-breeding.
(ii) Food requirements is taken care of.
(iii) Proper care and protection from diseases is ensured.

9. How do you differentiate between capture fishing, mariculture and aquaculture?

**Solution:**

<table>
<thead>
<tr>
<th>Capture fishing</th>
<th>Mariculture</th>
<th>Aquaculture</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) In this process, the fishes are captured from natural resources such as ponds, canals, rivers etc., (ii) In this method, fishes can be easily located and then caught by fishing nets.</td>
<td>(i) It is a process of culturing marine fish varieties in the open sea. (ii) In this method, echo-locators and satellites are used to find the fishes following which, they use different kind of nets to capture those fishes.</td>
<td>(i) It is a process of culturing both fresh water and marine fishes. (ii) In this method, the fishes can be located easily and can be caught by fishing nets.</td>
</tr>
</tbody>
</table>

**In-between chapter questions**

1. What do we get from cereals, pulses, fruits and vegetables?

**Solution:**

Cereals provide us carbohydrates for energy requirement. Cereals provide carbohydrates which fulfill the energy requirement. Pulses supply us with proteins, necessary for bodybuilding. Fruits and vegetables supply us with a wide variety of vitamins and minerals, additionally, small quantities of proteins, carbohydrates, and fats for regular growth, body development and maintenance of health is provided.
2. How do biotic and abiotic factors affect crop production?

**Solution:**

Biotic and abiotic factors significantly affect the production of crops. Crop yield decreases due to damage in the crops caused by biotic factors such as microorganisms, insects, and nematodes and by abiotic factors such as salinity, drought, waterlogging, cold, heat and frost.

3. What are the desirable agronomic characteristics for crop improvements?

**Solution:**

The desirable agronomic characteristics for crop improvement are:

(i) Fodder crops with tallness and profuse branching.

(ii) Cereal crops having dwarfness, so that the nutrients consumption is reduced.

These kinds of desired agronomic characters help in increasing productivity, thus improving crop yield.

4. How do plants get nutrients?

**Solution:**

Plants require various nutrients and it is supplied to it from different sources. Plants require about 16 essential elements, out of which carbon and oxygen are provided by air, hydrogen is provided by water and the other 13 essential nutrients are provided by the soil.

5. What are macronutrients and why are they called macronutrients?

**Solution:**

The nutrients to be essentially consumed in large quantities are known as macronutrients. Nutrients are needed by plants for their growth and development and plants require about 16 elements wherein 13 nutrients out of 16 of them are provided by the soil. About 6 of the 13 nutrients are required by plants in large quantities and hence known as macronutrients. The macronutrients are Nitrogen, Phosphorus, Calcium, Potassium, Magnesium, and Sulphur.

6. Compare the use of manure and fertilizers in maintaining soil fertility.

**Solution:**

<table>
<thead>
<tr>
<th>Manure</th>
<th>Fertilizer</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Manure are poor in nutrients and rich in organic matter.</td>
<td>(i) Fertilizers are poor in organic matter and rich in nutrients.</td>
</tr>
<tr>
<td>(ii) The fertility of soil increases due to the presence of organic matter in bulk quantity.</td>
<td>(ii) Fertilizers give out particular nutrients to the plants.</td>
</tr>
</tbody>
</table>
(iii) The water holding capacity in sandy soil is increased and water logging in clayey soil is also avoided due to the presence of organic matter.

(iv) Presence of organic matter serves as a food for microorganisms along with reducing soil erosion.

(iii) The profuse use of fertilizers not only harms the microorganisms but also destroy fertility in soil since organic matter is not replenished.

(iv) Water pollution is caused due to washing away of excess fertilizer due to extensive irrigation.

7. Which of the following conditions will give the most benefits? Why?

(a) Farmers use high-quality seeds, do not adopt irrigation or use fertilizers.
(b) Farmers use ordinary seeds, adopt irrigation and use fertilizer.
(c) Farmer uses quality seeds, adopt irrigation, use fertilizer and use crop protection measures.

Solution:
Option C helps farmers get most benefits. The use of quality seeds, adaptation of irrigation, usage of fertilizers and usage of proper measures for crop protection helps in producing high yielding crops.

8. What factors may be responsible for losses of grains during storage?

Solution:
Factors such as biotic and abiotic factors causes loss of grains during storage. Biotic factors are rodents, insects, mice, fungi and bacteria while abiotic factors include moisture and temperature of storage area.

9. Which method is commonly used for improving cattle breeds and why?

Solution:
Cross-breeding is the most commonly used method for improving cattle breeds. Animals with desirable qualities can be achieved by crossing a local breed with an exotic breed through cross-breeding. Let’s take an example of cattle, where in a cross between an exotic breed of cattle having long lactation period and a local breed of cattle having excellent resistance to diseases yields an offspring having the desired qualities of both the breeds.

10. Discuss the implications of the following statement: “It is interesting to note that poultry is India’s most efficient converter of low fire food stuff (which is unfit for human consumption) into highly nutritious animal protein food.”

Solution:
Poultry farming is primarily carried out in order to raise the domestic fowl for the production of egg and chicken meat. The feed used for the poultry birds are
cheap and fibrous which is prepared from a byproduct of agricultural elements unfit for human consumption. This way, a low fiber food stuff, which is unfit for direct human consumption is utilized for producing an animal food having high level of nutrition.

11. What are the differences between broilers and layers and in their management?

3.6+

**Solution:**

<table>
<thead>
<tr>
<th>Broilers</th>
<th>Layers</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Broilers are grown for obtaining meat.</td>
<td>(i) Layers are grown for laying eggs since they are mainly egg-laying birds.</td>
</tr>
<tr>
<td>(ii) The conditions for fast growth and low mortality is needed</td>
<td>(ii) The condition required is sufficient light and space.</td>
</tr>
<tr>
<td>(iii) The food composition should be rich in vitamin A and K &amp; proteins. There should be sufficient fat content.</td>
<td>(iii) The minerals, vitamins and micro nutrients are required in limited and calculated manner.</td>
</tr>
</tbody>
</table>

12. What management practices are common in dairy and poultry farming?

**Solution:**

Management practices common in both dairy and poultry farming are:

(i) Maintenance of proper shelter.

(ii) Specific nutritional requirements.

(iii) Protection from pests and diseases.

13. How are fish obtained?

**Solution:**

Fishes can be obtained in two ways. One of the ways is capture fishing, where in fishes are obtained from natural resources and another way is culture fishery, where in fishes are obtained from fish farms.

14. What are the advantages of composite fish culture?

**Solution:**

A combination of five or six fish species is grown in a single pond in composite fish culture. It is ensured that the species selected to grow together do not compete for food between themselves since they have different food habits. This guarantees that all the food available in the pond are utilized which automatically increases the yield of fish from the pond.

15. What are the desirable characters of bee varieties suitable for honey production?

**Solution:**
The desirable characters of bee varieties suitable for honey production are:

(i) Stingless
(ii) Remain in beehive for longer time and breed well.
(iii) Capability of collection of high content of honey.

16. Why should preventive measures and biological control methods be preferred for protecting crops?

**Solution:**

Adoption of proper preventive measures and biological control methods are preferable for protection of crops due to the following reasons:

(i) Preventive measures such as preparation of proper seedbed, sowing of seeds at the right time, intercropping and crop rotation promote weed control. It helps in the maintenance of the nutrient content of the soil.

(ii) Weeds and pests can be destroyed by using resistant varieties and summer ploughing.

(iii) The chances of environmental pollution can be reduced by using biological control method

17. What is pasturage and how is it related to honey production?

**Solution:**

The term pasturage refers to the availability of flowers to the bees for the collection of nectar and pollen grains for the purpose of pollination.

(i) The amount of available pasturage.

(ii) The taste of honey depends on the kind of flowers available for bees.