Science

(Chapter – 15) (Improvement in Food Resources)

(Class – IX)

Page 204

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

Sol. (i) Cereals provide us with carbohydrates. Also, they are a rich source of energy.

(ii) Pulses give us proteins.

(iii) Fruits and vegetables are a rich source of vitamins and minerals. A small amount of proteins, carbohydrates, and fats are also present in them.

Page 205

Q.1 How do biotic and abiotic factors affect crop production?

Sol. A variety of biotic factors such as pests, nematodes, diseases, etc. can reduce the net crop production. A pest causes damage to agriculture by feeding on crops. For example, boll weevil is a pest on cotton. It attacks the cotton crop, thereby reducing its yield. Weeds also reduce crop productivity by competing with the main crop for nutrients, light, and space.

Similarly, abiotic factors such as salinity, temperature, etc. affect the net crop production. Some natural calamities such as droughts and floods are unpredictable. Their occurrence has a great impact on crops sometimes, destroying the entire crop.

Q.2 What are the desirable agronomic characteristics for crop improvements?

Sol. The desirable agronomic characteristics for crop improvements are:

(i) Tallness and profuse branching in any fodder crop.

(ii) Dwarfness in cereals.

These desirable agronomic characteristic help in increasing crop productivity.

Page 206

Q.1 What are macro-nutrients and why are they called macro-nutrients?

Sol. Macro-nutrients are nutrients required in relatively large quantities for growth and development of plants. **They are six in number**. Since **they are required in large quantities**, they are known as **macro-nutrient**. The six macro-nutrients required by plants are **nitrogen, phosphorus, potassium, calcium, magnesium, and sulphur.**

Q.2 How do plants get nutrients?

Sol. Plants require **sixteen essential nutrients** from nature for their growth and development. All these nutrients are obtained from air, water, and soil. Soil is the major source of nutrients. **Thirteen of these nutrients are available from soil**. The remaining three nutrients (**carbon, oxygen, and hydrogen**) are obtained from air and water.

Page 207

Q.1 Compare the use of manure and fertilizers in maintaining soil fertility.

Sol. **Manures increase soil fertility by enriching the soil with organic matter** and nutrients as it is prepared by the decomposition of animal excreta and plant wastes. On the other hand, **fertilizers are mostly inorganic compounds whose excessive use is harmful to the symbiotic micro-organisms living in soil.** Their excessive use also reduces soil fertility. Hence, fertilizers are considered good for only short term use.

Page 208

Q.1 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) Farmers use quality seeds, adopt irrigation, use fertilizer and use crop protection measures.

Sol. (c) Farmers using good quality seeds, adopting irrigation, using fertilizers, and using crop protection measures will derive most benefits.

(i) The use of **good quality seeds increases the total crop production**. If a farmer is using good quality seeds, then a majority of the seeds will germinate properly, and will grow into a healthy plant.

(ii) **Proper irrigation methods improve the water availability to crops**.

(iii) Fertilizers ensure healthy growth and development in plants by **providing the essential nutrients such as nitrogen, phosphorus, potassium, etc.**

(iv) Crop protection measures include various methods to control weeds, pests, and infectious agents. If all these necessary measures are taken by a farmer, then the overall production of crops will increase.

Page 209

Q.1 Why should preventive measures and biological control methods be preferred for protecting crops?

Sol. Preventive measures and **biological control methods** should be **preferred** for protecting crops because **excessive use of chemicals leads to environmental problems**. These chemicals are also poisonous for plants and animals. Preventive measures include proper soil and seed preparation, timely sowing of seeds, inter cropping and mixed cropping, usage of resistant varieties of crops, etc. On the other hand, biological control methods include the usage of **bio-pesticides that are less toxic** for the environment. An example of bio-pesticides is Bacillus thuringenes, which is an insect pathogen that kills a wide range of insect larvae. Therefore, both preventive measures and **biological control methods are considered eco-friendly methods of crop protection.**

Q.2 What factors may be responsible for losses of grains during storage?

Sol. During the storage of grains, various **biotic factors** such as **insects, rodents, mites, fungi, bacteria,** etc. and various **abiotic factors** such as **inappropriate moisture, temperature, lack of sunlight,** etc. are responsible for losses of grains. These factors act on stored grains and result in degradation, poor germinability, discolouration, etc.

Page 210

Q.1 Which method is commonly used for improving cattle breeds and why?

Sol. Cattle farming is commonly used for improving cattle breeds. **The purpose of cattle farming is to increase the production of milk and draught labour for agricultural work**. Dairy animals (females) are used for obtaining milk and draught animals (males) are engaged in agricultural fields for labour work such as carting, irrigation, tilling, etc. Cross breeding between two good varieties of cattle will produce a new improved variety. For example, the cross between foreign breeds such as **Jersey Brown, Swiss** (having long lactation periods) and Indian breeds such as **Red Sindhi**, **Sahiwal** (having excellent resistance power against diseases) produces a new variety having qualities of both breeds.

Page 211

Q.1 Discuss the implications of the following statement: "It is interesting to note that poultry is India's most efficient converter of low fibre food stuff (which is unfit for human consumption) into highly nutritious animal protein food."

Sol. Poultry in India is the most efficient converter of **low fibre food stuff into highly nutritious animal protein food**. In poultry farming, **domestic fowls are raised to produce eggs and chicken**. For this, the fowls are given animal feeds in the form of roughage, which mainly consists of fibres. Thus, by **feeding animals a fibre rich diet, the poultry gives highly nutritious food** in the form of eggs and chicken

Page 211

Q.1 What management practices are common in dairy and poultry farming?

Sol. Common management practices in dairy and poultry farming are:

(i) **Proper shelter** facilities and their regular cleaning.

(ii) Some basic hygienic conditions such as **clean water, nutritious food**, etc.

(iii) Animals are kept in **spacious, airy, and ventilated place**.

(iv) Prevention and **cure of diseases at the right time** is ensured.

Q.2 What are the differences between broilers and layers and in their management?

Sol. **Layers are meant for egg production**, whereas **broilers are meant for poultry meat**. Nutritional, environmental, and housing conditions required by broilers are different from those required by egg layers. **A broiler chicken**, for their proper growth, **requires vitamin rich supplements specially vitamin A and K**. Also, their diet includes protein rich food and enough fat. They also require extra care and maintenance to increase their survival rate in comparison to egg layers.

Page 213

Q.1 How are fish obtained?

Sol. Fish can be obtained by two ways:

(i) **Capture fishing**: It is the process of obtaining fish from natural resources.

(ii) **Culture fishery**: It is the practice of farming fishes. Farming can be done in both fresh water ecosystem (which includes river water, pond water) and marine ecosystem.

Q.2 What are the advantages of composite fish culture?

Sol. An advantage of composite fish culture is that **it increases the yield of fish**. In a composite fish culture, **five or six different species are grown together in a single fish pond**. Fishes with different food habitats are chosen so that they do not compete for food among themselves. Also, this ensures a complete utilization of food resources in the pond. As a result, **the survival rate of fish increases and their yield also increases.**

Page 213

Q.1 What are the desirable characters of bee varieties suitable for honey production?

Sol. Bee varieties having the following desirable characters are suitable for honey production:

(i) They should yield **high quantity of honey**.
(ii) They should **not sting much**.
(iii) They should **stay in the beehive for long durations**.
(iv) They should **breed very well**.

Q.2 What is pasturage and how is it related to honey production?

Sol. Pasturage is the availability of Blowers from which bees collect nectar and pollen. It is **related to the production of honey** as it **determines the taste and quantity of honey**.

Science

(Chapter – 15) (Improvement in Food Resources)

(Class – IX)

Exercises

Question 1:

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

Answer 1:

Crop rotation is one of the methods of crop production that ensures high yield. It is the method of growing two or more varieties of crops on the same land in sequential seasons. A crop utilises some particular nutrients in larger quantities from the soil. Then, if the same crop is grown in subsequent seasons those nutrients will get depleted in the soil. Therefore, crops having different nutrient requirements are rotated. For example, legumes which have nitrogen-fixing bacteria in their root nodules supply the soil with nitrogen. Therefore, these legumes are rotated with nitrogen requiring cereals such as wheat and maize. This method reduces the need of fertilizers, thereby increasing the overall yield of crops.

Question 2:

Why are manures and fertilizers used in fields?

Answer 2:

Manures and fertilizers are used in fields to enrich the soil with the required nutrients. Manure helps in enriching the soil with organic matter and nutrients. This improves the fertility and structure of the soil. On the other hand, fertilizers ensure a healthy growth and development in plants. They are a good source of nitrogen, phosphorus, and potassium. To get an optimum yield, it is instructed to use a balanced combination of manures and fertilizers in the soil.

Question 3:

What are the advantages of inter-cropping and crop rotation?

Answer 3:

Inter-cropping and crop rotation both play an important role in increasing the yield of crops. Inter-cropping helps in preventing pests and diseases to spread throughout the field. It also increases soil fertility, whereas crop rotation prevents soil depletion, increases soil fertility, and reduces soil erosion. Both these methods reduce the need for fertilizers. It also helps in controlling weeds and controls the growth of pathogens and pests in crops.

Question 4:
What is genetic manipulation? How is it useful in agricultural practices?
Answer 4:
Genetic manipulation is a process where the gene for a particular character is introduced inside the chromosome of a cell. When the gene for a particular character is introduced in a plant cell, a transgenic plant is produced. These transgenic plants exhibit characters governed by the newly introduced gene.

For example, let us assume there is a wild plant that produces small fruits. If the gene responsible for a larger fruit size is introduced in this plant, this plant becomes transgenic, and starts producing larger fruits. Similarly, genes for higher yield, disease resistance, etc. can be introduced in any desired plant.

Therefore, gene manipulation plays an important role in agricultural practices. It helps in improving crop variety. It ensures food security and insect resistant crops. It also improves the quality and yield of crops.

Question 5:
How do storage grain losses occur?
Answer 5:
Factors responsible for such losses are biotic— insects, rodents, fungi, mites and bacteria, and abiotic— inappropriate moisture and temperatures in the place of storage. These factors cause degradation in quality, loss in weight, poor germinability, discolouration of produce, all leading to poor marketability.
These factors can be controlled by proper treatment and by systematic management of warehouses.

Question 6:
How do good animal husbandry practices benefit farmers?
Answer 6:
Cattle farming is one of the methods of animal husbandry that is most beneficial for farmers. Using this method, better breeds of draught animals can be produced. Such draught animals are engaged in agricultural fields for labour work such as carting, irrigation, tilling, etc.

Question 7:
What are the benefits of cattle farming?
Answer 7:
Benefits of cattle farming:

- Good quality and quantity of milk can be produced.
- Draught labour animals can be produced for agricultural work.
- New variety that are resistant to diseases can be produced by crossing two varieties with the desired traits.

Question 8:
For increasing production, what is common in poultry, fisheries and bee-keeping?
Answer 8:
The common factor for increasing production in poultry, fisheries, and bee keeping is the proper management techniques that are to be followed. Regular cleaning of farms is of utmost importance. Maintenance of temperature and prevention and cure of diseases is also required to increase the number of animals.

Question 9:
How do you differentiate between capture fishing, mariculture and aquaculture?
Answer 9:

Capture fishing	Mariculture	Aquaculture
It is the method of obtaining fishes from natural resources.	It is the culture of marine fishes for commercial use.	It involves the production of aquatic animals that are of high economic value such as prawns, lobsters, fishes, crabs, etc.