NCERT Solutions for Class 9th Science Chapter 15 – IMPROVEMENT IN FOOD RESOURCES

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

Ans Cereals – Carbohydrate

Pulses - Protein

Fruits and vegetables - A range of vitamins and minerals in addition to small amounts of proteins, carbohydrates and fats.

Q.2 How do biotic and abiotic factors affect crop production?

Ans Biotic factors can be defined as living components of the ecosystem with which an organism must interact. Various biotic factors such as diseases, insects and nematodes can reduce the crop production. For eg. pests can destroy or damage the crops, weeds (unwanted plants) which grow along the crop can take its nutrients and affect crop production.

On the other hand abiotic factors are chemical and physical factors such as temperature, soil composition, and climate, along with the amount of sunlight, salinity, and pH which affect the crop yield. For eg. lower temperature and excessive soil salinity will reduce the crop yield, natural calamities like drought and flood are unpredictable and can destroy the whole crop.

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

Ans Desirable agronomic characteristics for crop improvements are:

- 1) Tallness and profuse branching are desirable characters for fodder crops.
- 2) Dwarfness is desired in cereals, so that less nutrients are consumed by these crops.

Developing varieties of desired agronomic characters give higher productivity.

Q.4 What are macro-nutrients and why are they called macronutrients?

Ans Nutrients which are used by plants in large quantities are called macro-nutrients. They are six in numbers – nitrogen, phosphorus, potassium, calcium, magnesium and sulphur.

Since they are required by plants in large quantities, they are called macro-nutrients.

Q.5 How do plants get nutrients?

Ans Plants need nutrients for their growth, development and well being. Nutrients are supplied to them by air, water and soil. There are sixteen nutrients which are essential for plants. Air supplies carbon and oxygen, hydrogen comes from water, and soil supplies the other thirteen nutrients (6 macronutrients and 7 micronutrients) to plants.

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

Ans Manure is prepared by the decomposition of animal excreta and plant waste. Manure helps in enriching soil with nutrients and organic matter and increasing soil fertility.

Fertilizers are commercially produced plant nutrients. Fertilizers supply nitrogen, phosphorus and potassium. But continuous use of fertilizers in an area can destroy soil fertility because the organic matter in the soil is not replenished and micro-organisms in the soil are harmed by the fertilizers used.

Short-term benefits of using fertilizers and long-term benefits of using manure for maintaining soil fertility have to be considered while aiming for optimum yields in crop production.

- Q.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) Farmers use quality seeds, adopt irrigation, use fertilizer and use crop protection measures.
- **Ans** (c) Farmers use quality seeds, adopt irrigation, use fertilizer and use crop protection measures will give the most benefits. The reasons for the same are below:
 - 1) **Quality seeds:** The crop production or yield can be increased if a farmer uses quality seeds. Quality seeds result in more germination and yield and hence more production can be achieved.
 - 2) **Irrigation:** A proper irrigation method/system ensures that the crops get water at the right stages during their growing season and can increase the expected yields of any crop.
 - 3) **Fertilizers:** Fertilizers supply nitrogen, phosphorus and potassium. Their judicial use ensures good vegetative growth (leaves, branches and flowers) and give rise to healthy crops.
 - 4) **Crop protection:** Crop protection measures such as use of pesticides, weed control methods etc. are used to control weeds, insects and diseases in plants/crops. If weeds and pests are not

controlled at the appropriate time then they can damage the crops so much that most of the crop is lost. Hence crop protection measures improve crop production.

- Q.8 Why should preventive measures and biological control methods be preferred for protecting crops?
- Ans Preventive measures and biological control methods should be preferred for protecting crops because use of chemicals like pesticides, weedicides etc. creates problems, since they can be poisonous to many plant and animal species and cause environmental pollution. On the other hand preventive methods (such as proper seed bed preparation, timely sowing of crops, intercropping and crop rotation) and biological control methods (introduction of micro and macro organisms which are pests enemies) are environment friendly and do not cause harm to crops.
- Q.9 What factors may be responsible for losses of grains during storage?
- **Ans** Factors responsible for losses of grains during storage
 - 1) **Biotic factors:** Insects, rodents, fungi, mites and bacteria etc.
 - 2) Abiotic factors: Inappropriate moisture and temperatures in the place of storage.

These factors cause degradation in quality, loss in weight, poor germinability and discolouration of produce.

- Q.10 Which method is commonly used for improving cattle breeds and why?
- **Ans** Cross breeding is commonly used for improving cattle breeds.

The method of cross breeding helps in achieving an improved variety by using two good varieties of cattle. For eg. Exotic or foreign breeds (for example, Jersey, Brown Swiss) having long lactation periods can be cross-bred with local breeds (for example, Red Sindhi, Sahiwal) having excellent resistance to diseases to get animals with both the desired qualities.

- Q.11 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."
- Ans Poultry farming is undertaken to raise domestic fowl for egg production and chicken meat. The above statement means that the low fibre food stuff available in India, which is unfit for human consumption is a good food for hens. In return, they provide us with the highly nutritious animal protein food in the form of eggs and meat.
- Q.12 What management practices are common in dairy and poultry farming?

Ans Common management practices in dairy and poultry farming:

- 1) Proper shelter facilities with regular cleaning.
- 2) Maintenance of temperature and hygienic conditions like clean water, nutritious food etc.
- 3) Spacious and well ventilated places to keep animals.
- 4) Prevention and control of diseases and pests.
- 5) Timely vaccination.
- Q.13 What are the differences between broilers and layers and in their management?
- **Ans** Layers are produced for egg production whereas broilers are produced for poultry meat.

The housing, nutritional and environmental requirements of broilers are somewhat different from those of egg layers. Broiler chickens are fed with vitamin-rich supplementary feed especially vitamin A and K for good growth rate and better feed efficiency. Their diet is protein rich with adequate fat. In broilers special care is taken to avoid mortality and to maintain feathering and carcass quality.

- Q.14 How are fish obtained?
- **Ans** Fish are obtained in two ways:
 - 1) Capture fishing: Obtaining fish from natural resources such as rivers, ponds etc.
 - 2) **Culture fishery:** Obtaining fish by fish farming. Culture of fish can be done in marine as well as freshwater ecosystems.

Q.15 What are the advantages of composite fish culture?

Ans In composite fish culture, a combination of five or six fish species is used in a single fishpond. These species are selected so that they do not compete for food among them having different types of food habits. For eg. Catlas are surface feeders, Rohus feed in the middle-zone of the pond, Mrigals and Common Carps are bottom feeders, and Grass Carps feed on the weeds, together these species can use all the food in the pond without competing with each other.

Advantages:

- 1) This system utilises food available in all the parts of the pond, thus fish yield increases.
- 2) As there is no competition for food, the survival rate of fish increases.
- Q.16 What are the desirable characters of bee varieties suitable for honey production?

Ans Desirable characters of bee varieties suitable for honey production:

- 1) They should have high honey collection capacity or high yield of honey.
- 2) They should not sting much.
- 3) They should stay in a given beehive for long periods.
- 4) They should breed very well.
- Q.17 What is pasturage and how is it related to honey production?
- Ans Pasturage may be defined as the flowers available to the bees for nectar and pollen collection.

 Honey production depends on pasturage as the value or quality of honey depends upon the pasturage.

EXERCISES

- Q.1 Explain any one method of crop production which ensures high yield.
- Ans Inter-cropping is one of the method of crop production which ensures high yield. Inter-cropping is defined as a method of growing two or more crops simultaneously on the same field in a definite pattern. A few rows of one crop alternate with a few rows of a second crop, for example, soyabean + maize, or finger millet (bajra) + cowpea (lobia). The crops are selected such that their nutrient requirements are different. This ensures maximum utilisation of the nutrients supplied,

and also prevents pests and diseases from spreading to all the plants belonging to one crop in a

Q.2 Why are manure and fertilizers used in fields?

field. This way, the yield can be increased.

Ans Manure and fertilizers are used in fields to enrich soil with required nutrients. Manure (prepared by the decomposition of animal excreta and plant waste) helps in enriching soil with nutrients and organic matter and increases soil fertility.

On the other hand, fertilizers (commercially produced plant nutrients) supply nitrogen, phosphorus and potassium. They ensure good vegetative growth (leaves, branches and flowers) and give rise to healthy plants.

Manure and fertilisers should be used carefully and judiciously while aiming for optimum yields in crop production.

Q.3 What are the advantages of inter-cropping and crop rotation?

Ans Inter-cropping: Growing two or more crops in definite row patterns is known as inter-cropping.

- ♣ Advantages of Inter-cropping:
- 1) **Optimum utilisation of resources**: Crops are selected such that their nutrient requirements are different and hence ensures maximum utilisation of resources.
- 2) **Pests and disease control**: It prevents pests and diseases from spreading to all the plants belonging to one crop in a field.
- 3) **Improved soil fertility**: It helps in improving the soil fertility.
- 4) **High yield**: This method utilises land, nutrients etc. at optimum level and thus helps in achieving high yield.

Crop rotation: The growing of different crops on a piece of land in pre-planned succession is called crop rotation.

- ♣ Advantages of Crop rotation:
- 1) **Weeds control**: The sequential planting of different crops is intended to break the life cycle and suppress the growth of weeds.
- 2) **Control of pests and diseases**: Sequential planting of crops controls the growth of the pests and diseases which are host specific.

- 3) **Improved soil structure and organic matter content**: Planting of soyabean, other grain legumes, vegetables etc. return sufficient quantities of plant residues to the soil and thus add significant amount of organic matter.
- 4) **Improved soil fertility**: Alternating planting prevents the depletion of certain nutrients which might have occurred due to continuous growing of single crop. Thus the method prevents soil depletion and improves soil fertility.
- 5) **High yield**: This method utilises land, nutrients etc. at optimum level, replenish soil with nutrients (grain legumes etc.) and thus helps in achieving high yield.
- Q.4 What is genetic manipulation? How is it useful in agricultural practices?
- **Ans** Genetic manipulation is a way of improving the crop by introducing a gene that would provide the desired characteristics. This results in genetically modified crops.

It is very useful in agricultural practices as it can help in resisting biotic and abiotic stresses. Genetic manipulation is useful in following ways:

- 1) **Adaptability**: These varieties can be grown in diverse climatic conditions and can tolerate high soil salinity etc.
- 2) **High yield & improved quality**: Genetic manipulation produces high quality crops and enhances productivity.
- 3) **Reduced maturity duration**: This can reduce the maturity period (sowing to harvesting) and thus increase the profitability of crop production.
- 4) **Disease resistance**: It helps in producing disease resistant crops.
- O.5 How do storage grain losses occur?
- **Ans** Storage losses in agricultural produce can be very high. They occur due to two factors i.e. biotic and abiotic factors.
 - 1) **Biotic factors:** Insects, rodents, fungi, mites and bacteria etc.
 - 2) **Abiotic factors:** Inappropriate moisture and temperatures in the place of storage.

These factors cause degradation in quality, loss in weight, poor germinability and discolouration of produce.

- Q.6 How do good animal husbandry practices benefit farmers?
- Ans Animal husbandry is the scientific management of animal livestock. Cattle farming, one of the methods of animal husbandry benefits farmers as it helps in producing superior quality of draught animals. These draught animals can be used for labour work in agriculture such as tilling, irrigation and carting.
- Q.7 What are the benefits of cattle farming?

Ans Benefits of cattle farming:

- 1) **Increased milk production**: This method increases milk production and improves its quality.
- 2) **Superior draught animals**: It produces superior quality of draught animals. These draught animals can be used for labour work in agriculture such as tilling, irrigation and carting.
- 3) **Disease resistant breeds**: By applying cross breeding, new variety of disease resistant can be produced with desired qualities.
- Q.8 For increasing production, what is common in poultry, fisheries and bee-keeping?
- **Ans** The common factor for increasing production in poultry, fisheries and bee-keeping is the good management practices. This includes scientific methods of breeding, feeding and disease control. The good practices can be:
 - 1) Proper shelter facilities with regular cleaning.
 - 2) Maintenance of temperature and hygienic conditions like clean water, nutritious food etc.
 - 3) Prevention and control of diseases.
 - 4) Timely vaccination.
- Q.9 How do you differentiate between capture fishing, mariculture and aquaculture?
- Ans Capture fishing: Obtaining fish from natural resources such as rivers, ponds etc.

Mariculture: Fish farming or culture of fish in marine ecosystems for food and other necessities. It is the branch of aquaculture.

Aquaculture: Culture of aquatic organisms (plants and animals) in freshwater or marine ecosystems.