Introduction

All living organisms need food to derive energy for body development and survival. We obtain food from both plants and animals through agriculture and animal husbandry, respectively. It is important to bring improvement in food resources to meet the ever-increasing demand of the population. This includes the improvement of food resources not only in terms of quantity but also in quality, i.e. increase in yield as well as improvement in crop variety.

We need sustainable practices in agriculture and animal husbandry to achieve this without compromising the environment and natural balance. Mixed farming, intercropping, and integrated farming practices are some examples of sustainable and scientific management practices.

Food

Food supplies all the basic requirements, which are required for growth, development, and proper health. Food is a mixture of all nutrients, including carbohydrates, fats, proteins, vitamins and minerals.

To know more about Food Variety and Sources, visit here.

Agriculture

The science or practice of farming, including the cultivation of the soil, the growing of crops and the rearing of animals to provide food, wool, and other products is called agriculture.

Know more: Agriculture And Fertilizers

Sources of carbohydrates

Carbohydrates can be found in different forms, such as sugars, fresh fruits, starch, vegetables, cereals, corn, potatoes, fibres, bread, pastries, milk and milk products.

To know more about Sources of Carbohydrates, visit here.

Sources of fats

Fats are obtained naturally in several foods, such as butter, cheese, cream, and oilseeds including soybean, groundnut, etc.

Also read: Fats

Sources of vitamins and minerals

Vegetables and fruits are the main sources of vitamins and minerals. Some of the vitamins can also be obtained from meat and fish.

To know more about Sources of vitamins and minerals, visit here.

Sources of protein

The most common food which has a higher amount of protein are chicken, egg, fish, almond, chicken, oats, seafood, soybeans, pulses, cottage cheese, Greek yoghurt, milk, broccoli, and quinoa.

Also read: Proteins: An Overview

Fodder crops

Fodder crops like berseem, oats or sudangrass are raised as food for the livestock.

Kharif crops

The crops which are grown during the monsoon (June to October) are called Kharif crops. Black gram, cotton, green gram, maize, paddy, pigeon pea, and soybean, are all examples of Kharif crops.

Rabi crops

Crops which are grown during the winter season (October-March) are called Rabi crops. Wheat, gram, peas, mustard, and linseed are rabi crops.

Know more: Difference Between Rabi and Kharif Crops

Crop Variety Improvement

Varieties or strains of crops can be selected by breeding for various useful characteristics such as disease resistance, response to fertilisers, product quality and high yields. This is called crop variety improvement.

To know more about Crop Variety Improvement, visit here.

Hybridisation

Hybridisation refers to crossing between genetically dissimilar plants.

Intervarietal hybridisation

It is a cross between the two same species but with different varieties.

Interspecific hybridisation

It is a cross between two different species but the same genera.

Intergeneric hybridisation

It is a cross between the two intergeneric hybridisations belonging to different genera.

Also read: Artificial Hybridisation

Genetically modified crops

When a desirable gene is added to the genome of a crop, we get genetically modified crops.

Examples of genetically modified crops or GM crops are Bt cotton, Bt brinjal, golden rice, etc.

Factors for which a variety of improvement is done

There are several reasons for which different improved varieties of crops are generated. The reasons include:

1. Higher yield.
2. Improved quality.
3. Maturity duration.
4. Wider adaptability.
5. Biotic and abiotic resistance.
6. Desirable agronomic characteristics.

Read more: Crop Variety Improvement

Crop Production Improvement

Crop production management is the process that is used to effectively cultivate and harvest crops.

Nutrient management

A plant gets its nutrients from 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 to plants. Nutrient management is done by supplying the soil with required nutrients, by adding fertilizers and manures.

To know more about Nutrient Management, visit here.

Macronutrients

Among the 13 essential nutrients, 6 are the most essential nutrients required in abundance for the growth and development of plants. These essential nutrients are collectively called macronutrients.

Nitrogen (N), Phosphorus (P), Potassium (K), Calcium (Ca), Sulfur (S), and Magnesium are the macronutrients required by plants.

Micronutrients

Among the 13 essential nutrients, 6 are classified into macronutrients and the other 7 are classified into micronutrients. These nutrients include:
iron (Fe), boron (B), chlorine (Cl), manganese (Mn), zinc (Zn), copper (Cu) and molybdenum (Mo).
They are required in very small quantities, therefore, they are also called trace minerals.

To know more about Micronutrients, visit here.

Manure

Manure is an organic matter obtained from the solid wastes of animals, humans, sludge, sewage, domestic waste, decomposed dead plants and animals and other plant wastes including dry leaves twigs, agricultural wastes, weeds, etc. It contains a huge quantity of nutrients, which improves the soil quality and increase the yield of healthy crops.

To know more about Manure, visit here.

Compost and vermicompost

The process in which the biological waste material is decomposed in pits is known as composting. When compost is prepared by using earthworms to hasten the process it's called vermicompost.

To know more about vermicompost, visit here.

Green manure

Prior to the sowing of the crop seeds, some plants like sun hemp or guar are grown and then mulched by ploughing them into the soil. These green plants thus turn into green manure which helps in enriching the soil nutrients.

Fertilizers

Fertilizers are commercially produced plant nutrients, which are required in small quantities. There are various brands of this fertilizer are available in the market. A most common example of fertilizer is NPK fertilizer which provides nitrogen, phosphorus and potassium.

To know more about Fertilizers, visit here.

Organic farming

Organic farming is a farming system with minimal or no use of chemicals as fertilizers and with a maximum input of organic manures. All resources are used optimally to get maximum, chemical-free yield.

To know more about Organic farming, visit here.

Irrigation

Irrigation is the artificial process of applying water to crops to fulfil their water requirements. There are different types of irrigation practised for improving crop yield. This process helps in ensuring that the crops get water at the right stages. i.e. during their growing season, which helps in increasing the expected yields of crops. Irrigation is done with the help of Canals, Wells, River lift system, Tanks, Rainwater harvesting and watersheds.

Cropping pattern

Cropping pattern refers to the proportion of area under various crops. The three types of cropping patterns are:

Intercropping: It is a cropping technique in which two or more crops are cultivated simultaneously on the same piece of land adhering to a specific row pattern. This type of cropping pattern helps in increasing the productivity of the crops. Therefore, it is followed by small farmers who are completely dependent on rainfall for better yield.

Crop Rotation: It is a cropping technique, which is practised for growing different crops on the same land in preplanned succession. The crops are selected based upon their duration- on the one-year rotation, two-year rotation, and three-year rotation.

Mixed cropping: It refers to a cropping system where two or more crops are cultivated on the same piece of land simultaneously. This technique is most commonly followed by farmers as it reduces the risk of total crop failure because of less rainfall or adverse climatic conditions.

To know more about the Cropping patterns, visit here.

Crop Protection Management

Field crops are infested by a large number of weeds, insects, pests and diseases from which the crops should be protected.

Weeds

Weeds are unwanted plants in the cultivated field consuming all the soil nutrients finally reducing the crop yield.

Protection methods against weeds

To protect the crop against weeds, the following methods are employed.

1. Preparing a good seedbed.
2. Mechanical removal of weeds.
3. Plants the seeds in a timely fashion.

To know more about Crop Protection, visit here.

Effects of Insects and Pests on crops

Insect pests attack the plants in the following ways :

1. They cut the root, stem and leaves of the plants
2. They suck the cell sap from various parts of the plant.
3. They bore into stems and fruits resulting in a reduction in yields.

Pesticides and Insecticides

Pesticides and insecticides are chemicals that are used to kill or destroy pests and other insects that cause extensive damage to stored and freshly harvested crops. These chemicals are basically toxic in nature.

Fungi and Viruses

Fungi and viruses are diseases causing harmful microorganisms, which affect both the plants and newly yielded crops. These pathogens are destructive, as they destroy huge farms of crops.

A few examples of plant viruses are tobacco mosaic virus, cauliflower mosaic virus, cucumber mosaic virus etc. Disease-causing fungi are leaf rust, stem rust, powdery mildew etc.

Herbicides and Fungicides

They are highly toxic chemicals that are used to kill fungus and unwanted vegetation.

Storage losses

After harvesting, the newly obtained food grains are stored in huge storage facilities such as silos. However, due to the attack from pests or waterlogging, the food grains get destroyed. This is called storage loss.

Factors affecting storage loss

It is the loss caused to the postharvest system. The factors affecting the storage loss include both Abiotic and Biotic factors. Listed below are a few of them:

1. Storage losses due to living organisms such as insects, rodents, fungi, mites and bacteria are biotic factors.

2. Losses due to non-living organisms such as moisture and temperatures in the place of storage is called abiotic factors of storage loss.

Prevention and control measures for storage loss

Storage loss can be prevented by following certain protocols like:

1. Strict cleaning of the produce before storage.
2. Fumigation using chemicals that can kill pests.
3. Proper drying of the product first in sunlight and then in shade.

Animal Husbandry

Animal husbandry is farming and maintenance of animals for commercial purposes. Animals are raised for milk, meat and eggs.

Cattle

Cattle are reared by almost all farmers. In India, cattle are reared for milk and draught labour for agricultural work.

There are mainly two species of reared castles-, *Bos indicus* (cow) and *Bos bubalis* (buffalo) are

The exotic breeds of cows like Jersey, and Brown Swiss are reared for extended lactation.

The Indian breeds like Red Sindhi, and Sahiwal are reared for disease resistance and drought labour.

Many hybrids are also reared in India.

Poultry farming

Poultry farming is the form of animal husbandry which is undertaken to raise domestic fowl for the production of egg and chicken meat. Aseel, Busra Chittagong, and Ghagus are examples of the Indian varieties of poultry.

Plymouth rock Wyandotte, Rhode Island red and New Hampshire are examples of the American breeds.

Other examples include:

- English breeds are Sussex, Cornish, red caps, etc.
- Mediterranean Classes‘ such as leghorns’ white leghorns, Minorca, are more commonly reared.
- Layers are the egg-laying birds and broilers are reared for meat.

Fishery

Fishery deals with the procurement of fish for consumption. Fish is a good source of protein and forms the diet of people living in the coastal area. Fish can be obtained from the sea, freshwater bodies or even estuaries. The process of capturing fish is known as aquaculture. The different types of Fisheries are:

1. **Marine fisheries --** Marine fishery deals with fishing in the oceans and seas. Apart from fishes, it also deals with other seafood such as prawns, lobsters and crabs.
2. **Inland fisheries --** Inland fishery deals with fishing in rivers, lakes and tanks. Rohu, Catla, Mrigal, Grass carp etc are very popular varieties of fishes reared in freshwater.

Beekeeping

Beekeeping, also called apiculture is the rearing of bees for the production of honey and wax. This has become a major financially rewarding and agro-based activity. Some of the exotic varieties reared in India are *Apis mellifera, Apis adamsoni*. *Apis cerena indica,* commonly known as the Indian bee is a popular indigenous variety. *Apis dorsata,* known as Rock bee is also an indigenous variety.

Also Check:

- Natural Resources Class 9 CBSE Notes - Chapter 14
- NCERT Solutions Class 9 Science Chapter 15
- NCERT Exemplar Solutions Class 9 Science Chapter 15
- CBSE Class 9 Maths Number System Notes
- CBSE Notes Class 9 Geography Chapter 1 India - Size and Location

Frequently Asked Questions on CBSE Class 9 Biology Notes Chapter 15: Improvement in Food Resources

What are the uses of 'Intercropping'?

1. Saving space and resources 2. Repelling pests 3. Providing nutrients for neighbouring plants

What are the disadvantages of 'Weeds'?

1. Efficiency of irrigation is reduced 2. Land value reduces 3. Crop production decreases

What is the meaning of 'Organic farming'?

Organic farming is a production system which avoids or largely excludes the use of synthetically compounded fertilizers, pesticides, growth regulators, genetically modified organisms and livestock food additives.

To know more about Animal Husbandry, visit here.