Improvements In Food Resources

Solution 01:

Micronutrients
(i) They are required in very small quantities.
(ii) They are involved in enzyme activity and electron transport.
Example – Iron, Zinc

Macronutrients
(i) They are required in large quantities.
(ii) They have no significant role in enzyme activity and electron transport.
Example – Nitrogen, Calcium

Solution 02:

Source: (i) Air –
Nutrients:
Carbon (C)
Oxygen (O)
Hydrogen (H)

Source: (ii) Water
Nutrients:
Nitrogen (N)
Phosphorus (P)
Potassium (K)
Calcium (Ca)
Magnesium (Mg)

Source: (iii) Soil
Nutrients:
Iron (Fe)
Manganese (Mn)
Boron (B)
Zinc (Zn)
Copper (Cu)
Molybdenum (Mo)
Chlorine (Cl)
Sulphur (S)

Solution 03: Plants get nutrients through air, water and soil.

Solution 04: Nitrogen, phosphorus and potassium.

Solution 05:
Iron – Micronutrients.
Chlorine – Micronutrients.
Sulphur – Macronutrients.
Copper – Micronutrients.
Nitrogen- Macronutrients.
Calcium- Macronutrients.
Manganese- Micronutrients.
Potassium- Macronutrients.
Zinc- Micronutrients.
Magnesium- Macronutrients.
Molybdenum- Micronutrients.
Phosphorus- Macronutrients.

Solution 06:
Advantages of manures are:
(i) Manures are natural fertilizers.
(ii) Manures are bulky sources of organic matter which supply nutrients in small quantity and organic matter in large quantities.

Solution 07:
Limitations of using manures are:
(i) Manures are not nutrient specific.
(ii) Manures are not able to fulfill the high and rapid demand of nutrients required by improved high-yielding hybrid varieties of crops.

Solution 08;
Manure contains many organic substances of biological origin which can be easily degraded and absorbed by plants. It helps in recycling of biological waste. Manures increase the fertility of soil for long duration without causing any harm. However, the chemical fertilizers (e.g. urea) improve soil fertility for short duration but cause environmental hazard. Continuous use of fertilizers in a particular area / crop field causes destruction of soil fertility.

Solution 09:
Advantages of fertilizer over manure:
(i) Fertilizers are very rich in plant nutrient whereas manure contains small amounts of essential plant nutrients.
(ii) Fertilizers are soluble in water whereas manure is not soluble in water.

Solution 10:
As a result of this, the pond water would acquire a high concentration of nitrates and phosphates which would result in the excessive growth of algae and phytoplankton in the pond.

Solution 11:
Eutrophication is a process whereby water bodies, such as lakes or slow-moving streams receive excess nutrients that stimulate excessive plant growth (algae, phytoplankton's and nuisance plants weeds). This enhanced plant growth is also termed as an algal bloom.
Example: During rains the nutrients from the fields are washed away and get accumulated in nearby water bodies.

Solution 12:
The continuous use of chemical fertilizers in a particular area or crop field leads to loss of soil fertility.

Solution 13:
There are three methods of fertilizer applications in practice:
(i) Broadcasting: Uniform distribution over the whole cropped field.
(ii) Placement: Application in bands or in pockets near the plants or plant rows.
(iii) Foliar application: Using low or high volume sprayers, the fertilizers are sprayed covering the plants.

Solution 14:
Farmyard Manure : It is the decomposed mixture of cattle excreta, dung, urine, litter and left over organism matter such as roughage and Fodder.

Compost Manure : It is prepared from farm and town refuge such as vegetable and animal refuse.

Solution 15:

Manure – Manures are natural fertilizers. They are bulky sources of organic matter which supply nutrients in small quantities, and organic matter in large quantities. There are different types of manures: Farmyard manure (FYM), Compost, Green manures and Vermicompost. Manures affect the soil in following three ways:

(i) Manures enrich the soil with nutrients. They replenish the general deficiency of nutrients in the soil. Since manure contains fewer nutrients they need to be used in large quantities.

(ii) Manures add organic matter (called humus) to the soil which restores the soil texture, for better retention of water and aeration of soil.

(iii) The organic matter in manures provides food for the soil organisms, (decomposers such as bacteria, fungi, etc. which help in providing nutrients to plants.

Solution 16:
Green manuring is the practice which includes growing, mulching by ploughing and mixing of green crops with soil, to improve physical structure and soil fertility.
Example – Sunn hemp (Crotalaria juncea).

Solution 17:
Fertilizers – Fertilizers are one of the major components for obtaining higher yields especially in expensive farming practices. Fertilizers are divided into following four groups:

(i) Nitrogenous fertilizers – These fertilizers supply the macronutrient nitrogen.
Example – Urea, $CO(NH_2)_2$

(ii) Potassic fertilizers – These fertilizers supply potassium which is one of the essential macronutrient of the plants.
Example – Potassium sulphate, K_2SO_4.

(iii) Complex fertilizers – These fertilizers contains two or more nutrients.
Example – Nitrophosphate

Solution 18:
Biofertilisers – Organisms which enrich the soil with nutrients are called biofertilisers. Biofertilisers are used for the specific crop plants such as pulses, legumes, oil seeds and rice. They are renewable and non-pollutant sources of plant nutrient such as nitrogen. Nitrogen fixing microorganisms, i.e., non-symbiotic and symbiotic cyanobacteria and phosphate-solubilising microorganism are the main type of biofertilisers.

Solution 19:
A legume crop does not require nitrogenous fertilizers because its roots have root nodules which have nitrogenous bacteria called Rhizobium. This bacteria fixes atmospheric nitrogen and the plants converts nitrogen into various nitrogenous compounds.

Solution 20:
Irrigation is essential for the absorption of nutrient elements by the crop plants from the soil. The irrigation water tends to dissolve the nutrients present in the soil of a crop field to form a Solution. This Solution of nutrients is then absorbed by the roots of crops for the development of the plants.

Solution 21:
Excessive irrigation causes water logging and increases surface salinity which leads to soil salinity.

Solution 22:
Effects of excessive irrigation:
(i) It causes water logging.

(ii) It increases salinity in the soil.
(iii) The roots do not get proper aeration due to which they die.

Solution 23:
Water should be used judiciously because:
(i) It helps in the cultivation of crops.
(ii) In desert areas where there is scarcity of water, it is supplied through irrigation practices to prevent drought.

Solution 24:
Advantages of irrigation:
(i) It is necessary to provide sufficient moisture for the germination of seeds.
(ii) Irrigation of crop plants is essential for the growth and elongation of roots of the crop plants.
(iii) It is necessary to increase the number of aerial branches in crop plants.
(iv)It is essential for the absorption of nutrient elements by the crop plants from the soil.

Solution 25:
The efficiency of irrigation can be increased by:
(i) Drip and sprinkler system – It increases the efficiency of irrigation as it sprays water through pipes and a sprinkler.
(ii) River lift system – It is useful in those areas where canal flow is insufficient or irregular due to inadequate water release. The water is directly drawn from the rivers for supplement irrigation.

Solution 26:
There are two main factors responsible for loss of grains during storage:
(i) Biotic factors – Insects, rodents, birds, mites and bacteria.
(ii) Abiotic factors – They include moisture, temperature and other non-living environmental factors.

Solution 27:
Biotic and abiotic factors which cause destruction of grains during storage can be prevented by the following methods:

(i) Drying – The harvested food grains should be dried by spreading them over plastic sheets or cemented floors. All the sun dried food grains are allowed to cool to room temperature before storing them.

(ii) Cleaning – The grains should be properly cleaned before storage. They should be filled in new gunny bags before keeping in godowns, warehouses or stores.

Solution 28:
Drying – The harvested food grains is dried by spreading them over plastic sheets or cemented

floors. All the sun dried food grains are then allowed to cool to room temperature before storing them.

Solution 29:
For the storage of grains, grain silos are used. The silos are big and tall cylindrical structures. They are provided with outlets at different levels to withdraw the desired stock of grains. They have built in arrangement for aeration, temperature control, protection from insects, rats, birds etc.

Solution 30:
Field crops are infested with a variety of pests. There are various methods by which insects and diseases can be controlled. One of the most common and effective methods is the use of pesticides or biocides which include insecticides (for killing the insects), weedicides (for killing the weeds) and fungicides (for killing the fungi). Thus chemicals used to kill the pests, e.g. weeds; insects, mites, rodents and fungi are called pesticides. These chemicals are sprayed on crop plants or used for treating seeds and soil.

Solution 31:
During the grain storage, if the loss is due to the biotic factors which includes insects, rodents, birds, mites, fungi and bacteria, then it shows the presence of pests in the grain stores.

Solution 32:
Spraying:
(i) Spraying requires mechanical devices such as manual sprayer or mechanical sprayer.
(ii) It is less effective than fumigation.
Fumigation:
(i) It does not require any mechanical device.
(ii) It is more effective than spraying.

Solution 33;
Milk is rich in fat, tocopherol, proteins, calcium, and phosphorus and contains low sodium, potassium and cholesterol. It is ideal for making milk products like ghee, curd etc. Milk in comparison to other food products such as egg and meat contain all the major food constituents such as carbohydrates, proteins, fats, minerals, water and vitamins such as A and D.

Solution 34:
The animals which provide us food are cow, buffalo, hen and fish.

Solution 35:
Animal products used as food are: Milk, egg, meat, honey.

Solution 36:

Roughage:
(i) Roughage contains fibres such as green fodder, silage, hay and legumes.
(ii) It is high in fibre.

Concentrates:
(i) Concentrates are a mixture of substances which are rich in one or more nutrients.
(ii) It is low in fibre.

Solution 37:

The daily average feed of a cow is given below:
(i) Green fodder and dry grasses (roughage) = 15 to 20 Kg.
(ii) Grain mixture (Concentrates) = 4 to 5 Kg.
(iii) Water = 30 to 35 litres.

Solution 38:
The sources of concentrates are cotton seeds, oil seeds, grains of maize, oats, barley, jowar, bajra, gram and their by products such as wheat bran, rice bran, gram husk, oil seed cakes and molasses.

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Solution 39:

(i) The shelters should have roofed sheds which protects them from rain, heat, direct sunlight and cold.

(ii) The floor of cattle shed is made brick-lined and sloping for faciliating cleaning and keeping their sitting place dry.

(iii) The sheds or shelters should be provided with cross ventilation with sufficient number of inlets and outlets.

(iv) The shelters are provided with feeding passage and feeding trough.

Solution 40:
Artificial insemination; It generally gives improved breeds. This method is widely used to improve the qualities of cow, buffaloes, poultry, horse, sheep, goats and pigs. This method is economical, reliable and hygienic.

Solution 41:

(a) Cows are classified as draught, diary and dual purpose breeds.
(i) Draught breeds – Their meat is tough and gives little milk. They are used in agricultural practices.
(ii) Diary breeds – They have large digestive systems and gives large amount of milk.
(iii) Dual breeds – These breeds provide milk as well as help in agricultural tasks.

(b) Breeds of buffaloes – There are ten breeds of buffalo in our country. The important breeds of buffalo with high yield of milk are – Murrah, Mehsana and Surti.

Solution 42:

Steps involved in artificial insemination are:
(i) The semen of healthy and tough animal of high milk yielding breed is collected.
(ii) It is preserved by freezing or chemical methods.
(iii) The preserved semen is then injected into the genital tract of the female animal.
(iv) The preserved semen is injected during fertility period.

Solution 43:
Artificial insemination is the process of injecting the semen obtained from a desired male bull of high milk yielding breed into the genital or reproductive tract of female animal during heat period.

Advantages:
(i) It is economical because semen from a single bull can be used to impregnate several thousand cows.
(ii) It gives high rate of successful fertilization.

Solution 44:

Symptoms of sick animals:
(i) Fever
(ii) Constipation followed by severe diarrhea.
(iii) Restlessness
(iv) Irritation

Solution 45:
(a) Symptoms of Mastitis: Fever, udder becomes swollen, milk is watery.
(b) Symptoms of Foot-and-mouth: Blisters appear on the mouth and foot resulting in extreme soreness of the parts. Loss of appetite, excessive salivation, high fever accompanied by shivering and inability to work.

Solution 46:

The high yielding breeds of poultry are advantageous over indigenous breeds as:
(i) Improved quality and quantity of chicks.
(ii) Low maintenance requirement.
(iii) Improvement in egg production and reduction in the size of the layer.
(iv) Tolerance to high temperature.

Solution 47:
Advantages of fishery:
(i) Economically important desired fishes are raised in a small area.
(ii) Fishes are made to breed in different seasons.
(iii) There is little mortality in the younger stages of the fishes.
(iv) Through selective hybridization, yield and quality of fishes are improved.

Solution 48:
Poultry diseases can be prevented by giving good management practices. The growers require enough space as overcrowding tends to suppress their growth. Adequate lighting should be there. They should be provided with proper feed. Clean and hygienic conditions are must to keep them in good health and prevent them from diseases.

Solution 49:
Bee keeping is the rearing of honey bees which provide us with useful products such as honey, wax, propolis, royal jelly and bee venom.

Solution 50 :
Composite fish culture is advantageous and economical. It yields about 8-9 times more production than monoculture. All the species of fish live in distinct zone inside the pond and have distinct feeding habits.

Solution SAQ – 1:
Plants as food are gift of nature to humans and most animals. Different parts of plants, such as root, stem, leaf, flower and fruit are consumed by humans in the form of cereals, vegetables, spices and fruits. Animals produce milk, egg, meat, etc. which also supplement our food requirements.

Solution SAQ – 2:
Green revolution is the high production of food grains. The objectives of crop improvement are:
(i) Crop production management.
(ii) Crop variety improvement.
(iii) Crop protection management.

Solution SAQ – 3:

The cereals provide us with carbohydrates. The pulses provide us with proteins. Fruits and vegetables give us carbohydrates, protein, fat, vitamins, minerals and lots of fibers.

Solution SAQ – 4:
The basic objective of mixed cropping is to minimize the risk and insure against the crop failure due to abnormal conditions.

Criteria for the selection of crops for mixed cropping:
(i) The different crops to be grown together are so selected that the products and waste materials from one crop stimulates the growth of the other crop.
(ii) Care is taken to select crops that do not compete with each other for light, nutrients and water.

Solution SAQ – 5 :
Mixed Cropping:
(i) It aims to minimize the risk of crop failure.
(ii) Seeds of two crops are mixed before sowing.
(iii) It involves no set pattern of rows of crops.
Intercropping:
(i) It aims to increase the productivity per unit area.
(ii) Seeds of two crops are not mixed.
(iii) It involves set pattern of rows of crops.

Solution SAQ – 6:
Advantages of mixed cropping:
(i) The risk of total crop failure due to uncertain monsoon is reduced.
(ii) Chances of pest infestation are greatly reduced.
(iii) Fertility of the soil is improved by growing two crops simultaneously.
Disadvantages of mixed cropping:
(i) Seeds of two crops are mixed before sowing and there is no definite pattern for sowing the seeds.
(ii) Products of different crops are harvested, threshed, marketed and consumed in mixed form.

Solution SAQ – 7:
Intercropping is the practice of growing two or more crops simultaneously in a same field in definite row patterns with the objective of increasing productivity per unit area.
Mixed Cropping:
(i) It aims to minimize the risk of crop failure.
(ii) Seeds of two crops are mixed before sowing.
(iii) It involves no set pattern of rows of crops.
Intercropping:
(i) It aims to increase the productivity per unit area.

(ii) Seeds of two crops are not mixed.
(iii) It involves set pattern of rows of crops.

Solution SAQ – 8:

Disadvantages of crop rotation: Crops of the same family should not be repeatedly grown in the same field. This practice will promote build up of diseases and insect pests and decrease the similar nutrients from the soil.

Solution SAQ – 9:

Criteria for the selection of crops for crop rotation:
(i) Availability of moisture through rain or irrigation.
(ii) Status of nutrients in the soil.
(iii) Duration of crop – short or long.

Solution SAQ – 10:

Leguminous crops are required in crop rotation as they are used to increase the soil fertility. Those crops which require high fertility level may be grown after growing legumes. They also replenish the soil with nitrogen content.

Solution SAQ – 11:

The three steps involved in hybridization are:
(i) Introduction – This refers to the transportation of crop plants from the place of cultivation to the place where they were grown earlier.
(ii) Selection – This process involves the selection of most desirable offspring of a variety of plant for controlled propagation.
(iii) Hybridisation – It involves the crossing between genetically dissimilar plants to produce a new kind. Crossing may be between two different varieties (intervarietal cross – breeding) or between the two different species of the same genus (inter specific cross – breeding) and between different genera (intergeneric cross – breeding).

Solution SAQ – 12:

Plant breeding means production of new varieties or strains by a programme of artificial selection spanning several generations of the organism concerned.
It involves hybridization and mutation breeding.

(i) Hybridisation – It involves the crossing between genetically dissimilar plants to produce a new kind. Crossing may be between two different varieties (intervarietal cross – breeding) or between the two different species of the same genus (inter specific cross – breeding) and between different genera (intergeneric cross – breeding).

(ii) Mutation breeding – The breeding that takes place through various mutagens.

Solution SAQ – 13:
Biological method of weed control involves the deliberate use of insects or some other organisms which consume and specifically destroy the weed plants.
Example – Opuntia can be controlled by using cochineal insects in Maharashtra.

Solution SAQ – 14:
Plant disease Occurrence Transmission
(i) Blast Rice Air-borne
(ii) Rust Wheat Air-borne
(iii) Wilt Chick pea Soil-borne
(iv) Stem rot Pigeon pea Water-borne
(v) White rust Rice Mustard Air-borne

Solution SAQ – 15:
The ways by which the insects attack the crop plants are:
(i) The chewing insects destroy all sorts of crop plants. They cut the root, stem and leaf of the crop plants by the help of their chewing mouth parts.
(ii) Sucking insects suck the cell sap from various parts of the plant. They make fine punctures in the skin of plants with their needle – like, hollow beaks and suck the sap.
(iii) The internal feeders live inside the plant parts. They make holes in the developing grains.

Solution SAQ – 16:
Controlling insect pests:

(i) Root cutting type of insects is controlled by mixing insecticides in the soil.
Example – Chloropyriphos.

(ii) Stem and leaf cutting type of insects can be controlled by dusting or spraying the contact insecticides.
Example – Malathion, lindane and thiodan.

(iii) All sap sucking insects can be controlled by spraying systematic insecticides.
Example – Dimethoate and metasystox.

Solution SAQ – 17:
(a) Example of narrow leaved rabi season weeds are – Cyperus rotundas and Wild sorghum.
(b) Example of broad leaved kharif season weeds are – Amaranthus viridis and Trianthema.

Solution SAQ – 18:
The various methods of weed control are:
(i) Mechanical methods – These include uprooting, weeding with trowel or khurpi, hand hoeing, interculture, ploughing, burning and flooding.
(ii) Cultural methods – This includes the proper bed preparation, timely sowing of crops, intercropping and crop rotation.

(iii) Chemical methods – Herbicides and weedicides are sprayed on weeds to destroy weeds like – 2, 4 – D.
(iv) Biological methods – Biological method of weed control involves the deliberate use of insects or some other organisms which consume and specifically destroy the weed plants. Example – Opuntia can be controlled by using cochineal insects in Maharashtra.

Solution SAQ – 19:
Effect of weeds on crop plants:
(i) The growth of weeds in the crop fields is harmful because they compete with the crops for nutrients, water, space and light.
(ii) The weeds spread crop pests and diseases by acting as alternate host to insects and microorganisms.
(iii) Some weeds may produce toxic substances which may interfere with the growth of crop plants.
(iv) During harvesting weeds get mixed with crop's produce to downgrade its quality.

Solution SAQ – 20:
Crop's pest is any destructive organism which causes great economic loss by destroying crop plants or products obtained from them.
These can be controlled by the use of pesticides or biocides which includes insecticides, weedicides and fungicides. These chemicals are sprayed on crop plants or used for treating seeds and soil.

Solution SAQ – 21:
Insect resistant varieties are advantageous as they do not get infested with pests. Their genes are modified so pests cannot harm them. Therefore, pesticides are not used to protect them diseases which are toxic in nature and cause environmental pollution.