

Chapter - 1 Improvements In Food Resources

1. Sustainable Agriculture :-

It can be defined as the adoption of various farming & production management techniques to maximize agricultural yield.

2. Farming :-

It is the process the harnessing solar energy from plants and animals in the form of economic produce.

3. Integrated Agriculture :-

It implies a combination of agriculture with other forms of culture such as pisciculture, aquaculture etc.

4. Advantages of Sustainable Agriculture :-

- i. Achieves the integration of natural biological cycles & controls.
- ii. Protects & renews soil fertility.
- iii. Optimizes the management & use of farm resources.
- iv. Provides an adequate & dependable form of income.
- v. Promotes opportunity in family farming & farm communities.

Organic Farming :-

In organic farming there is little or no use of chemical fertilizers, pesticides & herbicides. There is no toxicity due to pollution of crop plants, soil, water or air. Organic wastes are recycled in the form of manure.

Advantages of Organic Farming :-

- i) It prevents pollution of any component of our environment.
- ii) Farm wastes are recycled.
- iii) The food obtained from organic farming are free from pesticides & toxic chemicals.
- iv) Organic farming maintains the soil health.
- v) The cropping system of organic farming keeps insect pests & weeds under check.

Types of Crops :-

Crops are plants which are cultivated by humans for food, fibre, flowers, timber etc. There are about 2000 plant species which are cultivated for eating purposes.

1. Seeds :-

Not all seeds of plants are edible. For ex:- large seeds such as those from a lemon pose a choking hazard, whereas seeds from apples & cherries contain poisonous CN#N cyanide. Edible seeds include pulses, or cereals, oil seeds & nuts (dry fruits).

2. Fruits :-

They include apple, mango, banana, pomegranate etc. Essentially fruits are ripened ovaries of plants & are a good source of vitamins, minerals, roughage, proteins, carbohydrates & fats.

3. Vegetables :-

They are the edible parts of the herbaceous plants. They are eaten in raw & cooked form. ~~veg~~ They include potato, carrot, spinach, lettuce.

4. Spices :-

Certain parts of some plants (eg. leaves, stem) are used to enhance the palatability of food. They include chilly, turmeric, black pepper etc.

5. Fodder Crops :-

They provide green fodder to the

cattle e.g. berseem, oat, sudan grass etc.

6. Other crops:-

Crop plants also yield fibres (e.g. cotton), tobacco, tea, coffee, etc.

Crop Seasons :-

Different crops required different climatic conditions, temperature & photoperiod for their growth & maturity. Photoperiod is duration of sunlight that influences plants in their growth, flowering, formation of storage organs, leaf fall etc.

Kharif Crops:-

These crops grow during rainy season (June to October). They are also called summer season crops.

Example:- Pulses, Cereals, maize, millet, mango, litchi, watermelon etc.

Rabi Crops:-

These crops grown from November to April. Rabi crops are also called winter crops.

Ex 1- Wheat, Barley, Gram etc.

Improvement in yields →

(i) Crop production Management :-

Crop production management refers to ~~the~~ controlling the various aspects of crop production to obtain maximum and best yield.

(ii) Nutrient Management →

Nutrient management means controlling the selection, timing and amount of nutrient supply to the crops. Nutrients are supply to the plants by air, water and soil.

Manure and Fertilisers

Manure - Manures are natural fertilizers.

Manures are prepared by the decomposed animals excreta and plants waste

Advantages of manure →

- (i) Manures enrich the soil with nutrients.
- (ii) Manures added organic matter to the soil which restores its fertility.
- (iii) It also provide food for the soil organisms

Disadvantages - Manures are bulky with low nutrient content. These are unable to fulfill the high and rapid demand of nutrients.

Fertilizers →

Fertilizers provide plant nutrients commercially manufactured using chemicals. Fertilizer is one which contains all the three critical elements i.e. nitrogen, phosphorus and potassium.

Difference between manures and fertilizers-

Manure

- * Manure is a natural substance which is obtained by the decomposition of animal wastes.
- * Manure add a great amount of organic matter in the form of humus in the soil.
- * Manure is bulky so it is inconvenient to store, transport and handle.
- * Manure is cheap and is prepared in rural homes.

Fertilizers

- * Fertilizer is a human made substance. It is an inorganic salt.
- * It doesn't add any humus to the soil.
- * Fertilizer is compact and concentrated so it is easy to store and transport.
- * Fertilizers are costly and are prepared in factories.

Irrigation - The process of supplying water to crop plants by means of canals, wells, tube-well etc is known as irrigation.

Water management → It is the arranging and supplying required water to crops without harming the soil aeration, change of water table or able of causing water logging etc.

Advantages of irrigation →

- (a) Crop plants are irrigated with fresh-water to supply two essential elements (hydrogen and oxygen) to them.
- (b) Irrigation of crop fields is necessary to provide sufficient moisture for the germination of seed.
- (c) It also increases the no. of aerial branches in crop plants.

Factors controlling Irrigation →

* Factors Controlling Irrigation are of many types:-

1. Crop based irrigation:-

Water requirements of

different crops are different during the various stages of their growth & maturation.

Soil based irrigation:-

Irrigation also depends on the nature of the soil in which crop is grown.

Irrigation Systems:-

01. Canal System:-

In canal system, the human made canals receive water from one or two reservoirs or from rivers.

02. Tanki:-

Tanks are small storage reservoirs which catch & store the runoff of smaller catchment areas.

03. Wells:-

Wells are constructed wherever exploitable ground water is present.

04. River Lift System:-

River lift system is

more useful in those areas where canal flow is insufficient or irregular due to inadequate water release.

05. River Valley System:-

In this system, water is discharged into the steep and narrow riverine valleys, during the rainy season.

06. Drip & Sprinkler System:-

Overhead pipes from spraying water & sprinkler system save a lot of water & are more ~~re~~ natural.

Water Augmentation:-

Water availability for irrigation can be assured by augmenting ground water.

Cropping Patterns

i. Mixed Cropping:-

Growing two or more crops simultaneously in the same piece of land is called mixed cropping.

Advantages of mixed cropping :-

The risk of total crop failure due to uncertain monsoon is reduced.

Due to complementary effect of component crops, yield of both crops is increased.

Fertility of the soil is improved by crop growing two crops simultaneously.

Chances of pest infestation are greatly reduced.

ii Intercropping :-

Intercropping is a 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.

Advantages of intercropping :-

It makes the better use of the natural resources of sunlight, land & water. Soil erosion is

Crop Rotation:-

The practice of growing of different crops on a piece of land in a preplanned succession.

Advantages of Crop Rotation:-

- [i] It controls pests & weeds.
- [ii] Crop rotation reduces the needs of fertilizers.
- [iii] Several crops may be grown in succession with only soil preparation (ploughing).
- [iv] By alternation between deep & shallow rooted crops, the soil may be utilised more completely.

Crop variety Improvement:- The art of recognising valuable traits & incorporating them into future generation is very important in plant breeding. Breeder's search for individual plants that exhibit desirable traits.

[i] Need for Higher Crop Yield:-

[i] Higher Yield:- The main aim of crop improvement is to improve the productivity of economic produce e.g. grain, vegetables & fodder.

[ii] Improved quality:- Quality considerations of crop products varies from crop to crop e.g. baking quality in wheat.

[iii] Biotic & Abiotic Resistance:-

Under different situations crop suffers due to biotic stresses (as diseases) & abiotic stresses (as drought).

[iv] Changes in Maturity duration:-

Uniform maturity will make the harvesting process easy & reduce the loss of produce during harvesting.

[v] Photo insensitivity & thermo-insensitivity:- Development of photo-insensitivity & thermo-insensitive crop varieties will help in crossing the cultivation boundaries.

[vi] Desirable agronomic traits:-

If we develop these varieties of crop which contain desired agronomic traits then it will help in setting higher production.