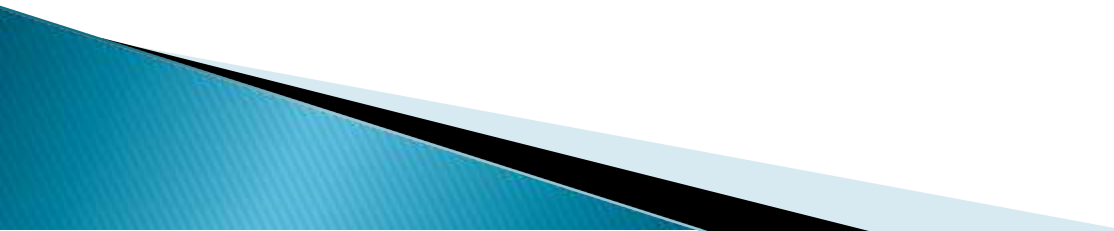


Class 9
CHAPTER 15–
IMPROVEMENT IN FOOD
RESOURCES

- ▶ **Food Resources:** Cereals (Wheat, rice, maize, millets and sorghum) provide us carbohydrates; Pulses (Grams, pea and lentil) provide us proteins; Oil seeds (Soya bean, ground nut, sesame, and castor) provide us fats; Vegetables, spices and fruits provide us a range of minerals, nucleic acids and vitamins. In addition to these food crops, fodder crops like berseem, oats or sudan grass are raised as food for the livestock are called as fodder crops.
 - ▶ **The Kharif crops:** The crops grown in rainy season are called as **Kharif crops (Paddy, Soya bean, pigeon pea and maize)**. They are grown from June to October.
 - ▶ **The Rabi crops:** The crops grown in winter season are called Rabi crops (Wheat, gram, peas, and mustard). They are grown November to April. Compare
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CROP IMPROVEMENT

- ▶ CROP VARIETY IMPROVEMENT
- ▶ CROP PRODUCTION MANAGEMENT
- ▶ CROP PROTECTION



CROP VARIETY IMPROVEMENT

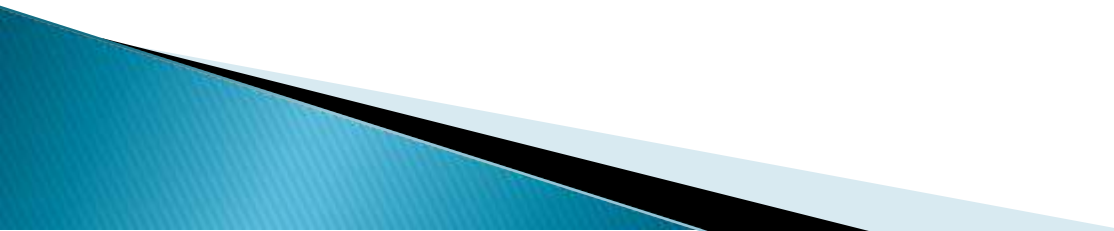
Different methods of Crop Variety Improvement

1. **Hybridisation** – In this process, genetically different plants are crossbred.
 - ▶ They can be three types of crossing
 - ▶ **Intervarietal** – Between two varieties of a plant
 - ▶ **Interspecific** – Between two species belonging to same genus
 - ▶ **Inter Generic** – Between species of different genus
2. **Introduction of Gene** – A gene that can provide the desirable characteristics to a crop are introduced in this process. As a result, we obtain genetically modified crops.
 - ▶ **Factors on which Crop Yield Generally Depends**
 - ▶ **The seeds used by the farmers** – The seeds that are of similar variety are preferable.
 - ▶ **Climate or Weather Conditions** – Crops that can sustain diverse climatic conditions are preferable.
 - ▶ **The duality of the Soil** – Crops that can survive in a highly saline soil are preferable.
 - ▶ **Availability of Water** – Crops should be grown as per the availability of water in the region.

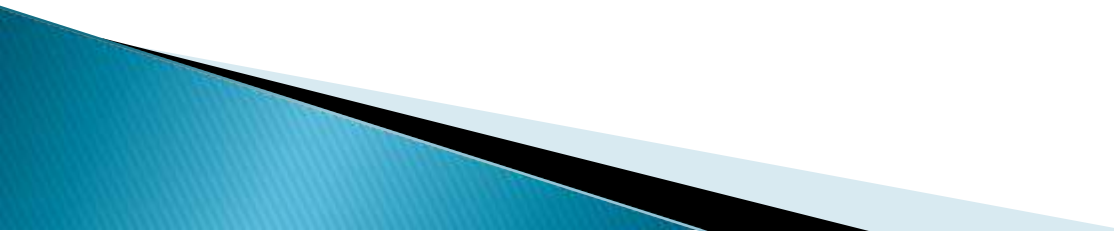
▶ **The factors for which variety improvement is done are:**

- (i) Higher yield**
- (ii) Improved quality**
- (iii) Biotic and abiotic resistance**
- (iv) Change in maturity duration**
- (v) Wider adaptability**
- (vi) Desirable agronomic characteristics**

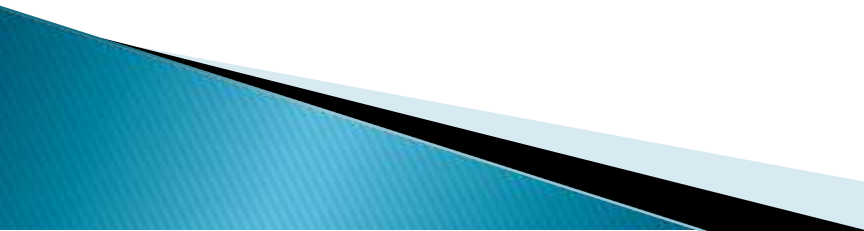
▶ **Plant nutrients:** Nutrients are supplied to plants by air, water and soil. There are sixteen nutrients which are essential for plants. Air supplies carbon and oxygen; hydrogen comes from water and soil supplies the other thirteen nutrients to plants. Amongst these thirteen nutrients, six are required in large quantities and are therefore called macro-nutrients. The other seven nutrients are used by plants in small quantities and are therefore called micro-nutrients.



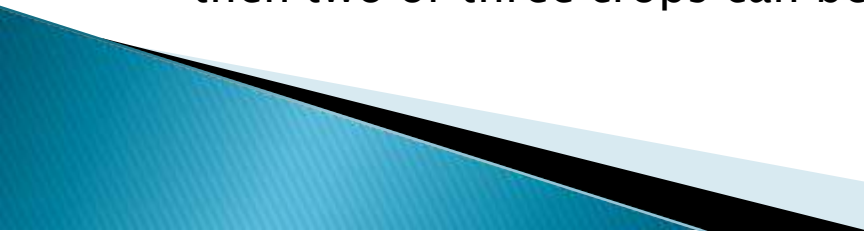
CROP PRODUCTION MANAGEMENT

- ▶ FERTILISERS
 - ▶ MANURE
 - ▶ COMPOSTING
 - ▶ GREEN MANURE
 - ▶ CROPPING PATTERNS
 - ▶ IRRIGATION
 - ▶ ORGANIC FARMING
- 

Irrigation

- ▶ **Irrigation:** Proper irrigation is very important for the success of crops. Ensuring that the crop gets water at the right stages during their growing season, can increase the expected yield of a crop. Different kinds of irrigation systems include wells, canals, rivers and tanks.
 - ▶ **Wells:** These are of two types namely dug wells and tube wells. In a dug well, water is collected from water bearing strata. Tube wells can tap water from the deeper strata. From these wells, water is lifted by pumps for irrigation.
 - ▶ **River lift system:** In areas where canal flow is insufficient or irregular due to inadequate reservoir release, the lift system is more rational. Water is directly drawn from the rivers for supplementing irrigation in areas close to rivers.
 - ▶ **Tanks:** These are small storage reservoirs, which intercept and store the run-off of smaller catchment areas
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Cropping patterns

- ▶ **Cropping patterns:** It includes different ways of growing crops so as to get the maximum benefit. These different ways include the following:
 - ▶ **Mixed cropping:** Mixed cropping is growing two or more crops simultaneously on the same piece of land, for example, wheat + gram, or wheat + mustard, or groundnut + sunflower. This reduces disease risk and gives some insurance against failure of one of the crops.
 - ▶ **Inter-cropping:** It involves growing two or more crops simultaneously on the same field in definite proportion or 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 field. This way, both crops can give better returns.
 - ▶ **Crop rotation:** The growing of different crops on a piece of land in a preplanned succession is known as crop rotation. Depending upon the duration, crop rotation is done for different crop combinations. The availability of moisture and irrigation facilities decide the choice of the crop to be cultivated after one harvest. If crop rotation is done properly then two or three crops can be grown in a year with good harvest.
- 

Weeds

- ▶ **Weeds:** Weeds are unwanted plants in the cultivated field, for example, Xanthium (gokhroo), Parthenium (gazar ghas) and Cyperinus rotundus (motha). They compete for food, space and light. Weeds take up nutrients and reduce the growth of the crop. Therefore, removal of weeds from cultivated fields during the early stages of crop growth is essential for a good harvest.
- ▶ • **Methods of weed control:** The most effective method is the mechanical removal. Preventive methods such as proper seed bed preparation, finely sowing of crops, inter-cropping and crop rotation also help in weed control.
- ▶ • **Insect pests:** Generally insect pests attack the plants in three ways: (i) They cut the root, stem and leaf, (ii) they suck the cell sap from various parts of the plant, and (iii) They bore into stem and fruits. They thus affect the health of the crop and reduce yields.
- ▶ • **Preventive measures against pest include:**
 - (i) The use of disease resistant varieties.
 - (ii) Growing two or more crops simultaneously on the same field.
 - (iii) **Summer ploughing:** In this method, fields are ploughed deep in summers to destroy both pests as well as weeds.

CROP PROTECTION MANAGEMENT

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graph TD; A[CROP PROTECTION MANAGEMENT] --> B[PESTICIDES]; B --> C[PREVENTIVE MEASURE]; B --> D[BIO PESTICIDE]
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PESTICIDES

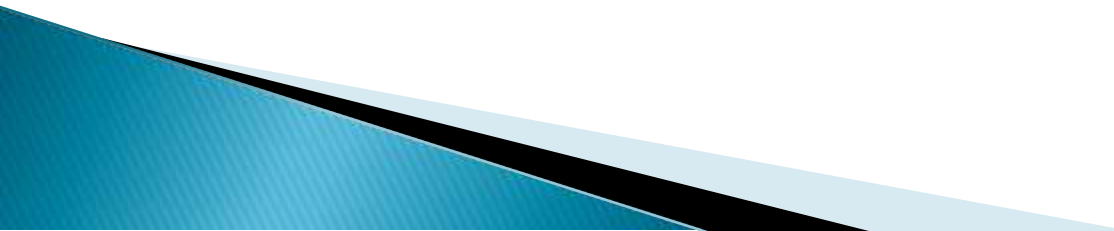
PREVENTIVE
MEASURE

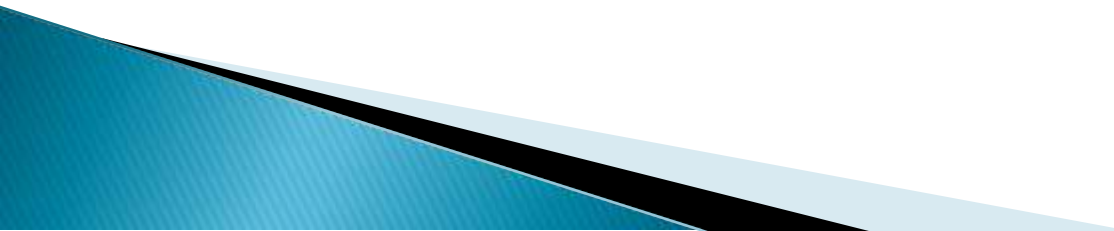
BIO PESTICIDE

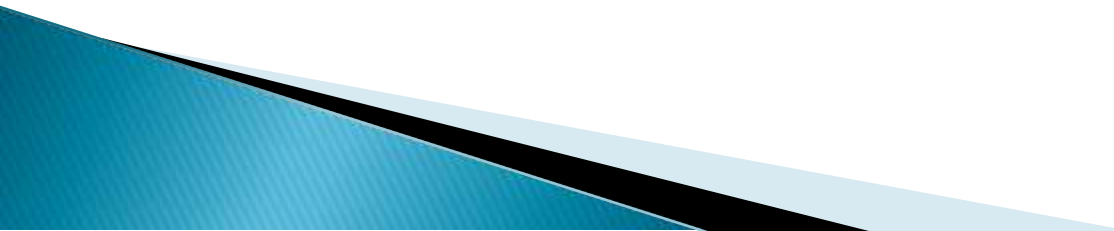
Animal Husbandry

- ▶ **Animal husbandry includes the following:**

Cattle Farming

- ▶ Cattle are used for two reasons –
 - ▶ They provide milk
 - ▶ They work as draught labour in the fields
 - ▶ **Milch Animals:** Animals that provide milk are called **Milch Animals**.
 - ▶ **Draught Animals:** Animals that work in the fields for irrigation, carting and tiling are called **Draught Animals**.
- 

- ▶ **Can we increase milk production in cattle?**
 - ▶ Milk production can be enhanced by increasing the lactation period in the cattle.
 - ▶ Crossbreeding of foreign breeds and local breeds can provide cattle with qualities of increased lactation period and resistance to diseases.
 - ▶ Shelters of the cattle should be kept neat and clean in order to keep the cattle healthy.
 - ▶ The cattle should be kept clean and should be provided with a covered shelter that can protect them from harsh weathers.
 - ▶ The floor of the shelters to be kept a dry and clean
- 

- ▶ **Food requirements of dairy animals:**
 - ▶ Maintenance requirements: the food that is required to keep the animals healthy
 - ▶ Milk production requirements: the food that is needed in the lactation period
 - ▶ Animal feeds
 - **Roughage** – contains fibre
 - **Concentrates** – contains low fibre but high nutritional value
 - **Feed Additives** – includes food that contains micronutrients that can promote health and milk production
- 

- ▶ **Protecting the Cattle from Diseases:**
 - ▶ Diseases can lead to a reduction in the production of milk and even the death of cattle.
 - ▶ Mainly parasites can affect the health of the cattle. These parasites can be found in the animals or they may attack them externally.
 - ▶ The internal parasites generally damage the liver and stomach of these animals. For example, worms and flukes.
 - ▶ The external parasites cause skin diseases in cattle.
 - ▶ Sometimes bacteria and virus also called several diseases in the cattle.
 - ▶ A good way to prevent diseases is vaccination
- 

POULTRY FARMING

- ▶ Poultry farming includes different kinds of domesticated birds. Different types of poultry are Chicken, Duck, Goose, Pigeon, Turkey

It is mainly done for:

- ▶ getting eggs through layers
- ▶ getting chicken meat through broilers
- ▶ **Examples of Poultry Birds:**
- ▶ **Indigenous breeds:** Aseel, Burosa
- ▶ **Foreign breeds:** Leghorn, Black Minorca
- ▶ Crossbreeding is a way to achieve this. Generally, foreign breeds of chicken are crossed with Indian breeds to achieve high quality. It thus has better traits such as:
- ▶ Increase in a number of chicks.
- ▶ They can tolerate high temperatures.
- ▶ They do not require much maintenance
- ▶ They can survive cheap diets

Egg and broiler production

Broiler Chicken

- ▶ They need a diet with a high quality of Vitamins A and K, proteins and fats.
- ▶ They need special care to maintain feathering and avoiding death.
- ▶ Proper hygiene and temperature conditions should be provided to the broiler chicken.

Layers

- ▶ They do not require such nutrient-rich diet.
- ▶ They just need a controlled diet.
- ▶ The layers require more space and lightning as compared to the broilers.
- ▶ Disease Control methods should also be adopted against the diseases that are generally caused by bacteria, fungi and parasites in broilers and layers. Disinfectants can be sprayed regularly to avoid such diseases. Sometimes deficiency of nutrition can also need to diseases. Vaccination is a good way to protect the poultry fowl from diseases.

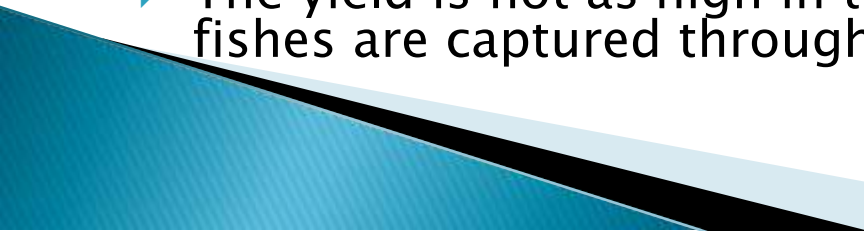
Fish Farming

- ▶ Fish can be obtained in two ways:
- ▶ From Natural Resources – Capture Fishing
- ▶ From Fish Farming – Culture Fishing

Marine Fisheries

- ▶ Marine fishes are caught using fishnets and mechanical capturing techniques.
- ▶ The main source of marine fishes is marine water or salt water.
- ▶ Generally, large numbers of fishes can be captured at a time through mariculture.
- ▶ **For Example**, tuna, Bombay duck, prawns

Inland Fisheries

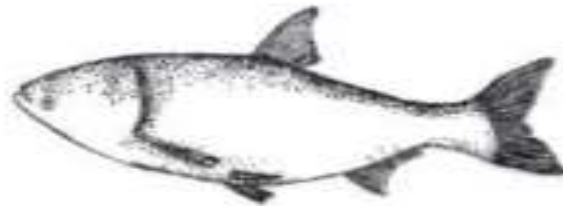
- ▶ Fishes found in lakes, ponds, lagoons and rivers are captured.
 - ▶ The main source of Inland fisheries is freshwater and brackish water.
 - ▶ The yield is not as high in these sources hence large numbers of fishes are captured through aquaculture.
- 

- ▶ **Aquaculture:** It is a method of farming aquatic animals under controlled circumstances. It is performed in both freshwater and saltwater bodies.
- ▶ **Mariculture:** It is a branch of aquaculture hence a method of fish farming under control environment. Mariculture is often performed in the ocean, a particular section of the ocean or in the tanks that are filled with seawater only.
- ▶ **Composite fish culture**
 - ▶ In a composite fish culture, fishes are grown along with rice crop in the paddy fields.
 - ▶ In this method, a combination of 5 – 6 local as well as foreign fishes is grown in a single pond.
 - ▶ Such species are selected because they have different food habits and would not compete for the food with each other.
 - ▶ Some of them are surface feeders; some are middle zone feeders while others are bottom feeders.
 - ▶ They would rather eat all the food in the pond.
 - ▶ As a result, the fish yield in the pond increases

FISH FARMING



(a)



(b)



(c)



(d)



(e)

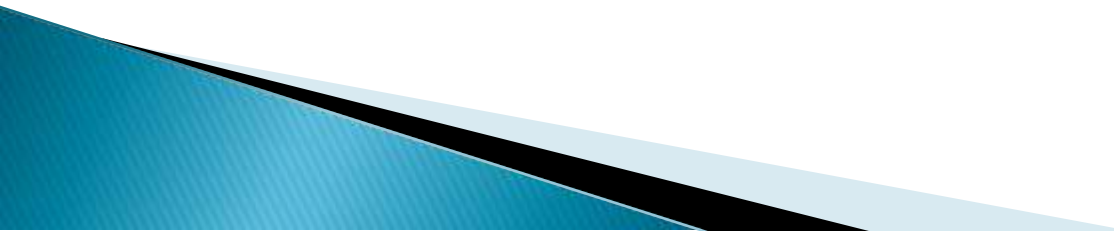


(f)

BEE KEEPING

- ▶ Bee farming is performed in bee farms or apiaries. Many farmers perform beekeeping as a means of generating additional income because:
- ▶ Honey is a widely used product
- ▶ Bee farming is not very expensive
- ▶ They also generate wax along with honey

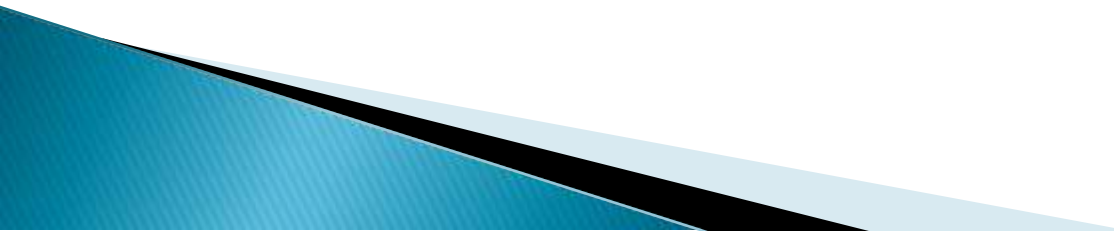
Bees used for commercial and honey production

- ▶ *Apis Cerana Indica* – Indian bee
 - ▶ *A. Dorsata* – The rock bee
 - ▶ *A. Florae* – The little bee
 - ▶ *A. Mellifera* – Italian variety of bee
- 

Why Italian bees are popular in bee farming?

- ▶ They produce large amounts of honey.
- ▶ They do not sting much.
- ▶ The breeding period in Italian bees is long.

Factors that determine the quality of honey

- ▶ Along with the choice of selection of the bee species, the flowers decide the quality quantity and taste of the honey produced.
 - ▶ There should also be enough pasturage or availability of flowers to the bees so that they can collect enough nectar and pollen.
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THANK YOU

