Crop Production and Management
Applying Manures and Feritlisers

❖ **Manuring:** Farmers have to add manure to the field to replenish the soil with nutrients, the process known as manuring.

- **Manure :** These are organic substances, obtained from the decomposition of plant and animal wastes.

❖ **Advantages of manure :**

- It increases the number of friendly microbes.
- It improves the texture of soil by adding organic matter (humus).
- It increases soil fertility, water holding capacity and aeration.
- It reduces soil erosion.
- It is cheap.

❖ **Disadvantage of manure :**

- They have less amount of nutrients as compared to fertilizers.

❖ **Fertilizers :** These are commercially manufactured inorganic salts containing one or more essential plant nutrients like NPK, which are used to increase soil fertility.

❖ **Advantages of fertilizers :**

- They are nutrient specific and required in small amounts.
- They are water soluble and absorbed by the plant easily.
- They are easy to store and transport.

❖ **Disadvantages of fertilizers :**

- Fertilizers can change the soil structure by killing the soil microbes.
- Fertilizers can change the chemical composition of soil.
- Accumulation of fertilizers in water bodies causes eutrophication.

❖ Differences between manures and fertilizers :

S. No.	Manures	Fertilizers
1	These are organic substances obtained by the decomposition of plant and animal wastes.	These are artificial inorganic salts.
2	They are rich in organic nutrients, not rich in (NPK).	They are rich in Nitrogen, Phosphorus and Potassium (NPK).
3	They are not nutrient specific.	They are nutrient specific.
4	They are not soluble in water so absorbed slowly by plants.	They are soluble in water and absorbed quickly.
5	They are not harmful to the environment.	They are harmful to the environment.
6	They have nutrients in small quantity so needed in large quantity.	They have higher amount of nutrients so required in very small
7	They are bulky substances so difficult to store and transport.	They are in concentrated form and easy to transport and store.
8	They are prepared in field.	They are prepared in factories.

❖ **Classification of plant nutrients:**

• There are 16 essential elements for growth and development of plants. They are classify into two gropes

• **Macro nutrients:** These are required in large quantity. e.g - Carbon, oxygen, hydrogen, nitrogen, phosphorus, potassium, sulphur, calcium, magnesium.

• **Micro nutrients :** These are required in trace amount. e.g - Iron, manganese, boron, zinc, copper, molybdenum, chlorine.

S.No.	Sources	Nutrients	Types
1.	Air	Carbon, Oxygen.	Macro nutrients.
2.	Water	Hydrogen.	Macro nutrients.
3.	Soil	Nitrogen, Phosphorus, Potassium, Sulphur, Calcium, Magnesium.	Macro nutrients.
		Iron, Manganese, Boron, Zinc, Copper, Molybdenum, Chlorine.	Micro nutrients.