CHAPTER TWENTY NINE

PLANT NUTRIENTS AND SOIL

- These are sources of food needed for plant growth.
  - They are normally obtained from air and water.
  - Nutrients obtained from the air include oxygen, nitrogen and carbon dioxide.

Types:

- There are two types and these are:
  (1) The major nutrients.
  (2) The minor nutrients.

The major nutrients:

- These are those nutrients which are needed in large quantities or amount for plant growth.
- They are also referred to as the macro nutrients.
- Examples are nitrogen, potassium, calcium, sulphur andphosphorus.

Functions of certain major nutrients:

Nitrogen:

- It helps in the development of fruits and tubers.
- It helps the development of the deep green colour in plants.

Phosphorus:

- It encourages the development of roots.
- During a plant`s maturity stage, it helps in the ripening of the fruits.
- It stimulates the activity of nitrogen fixing bacteria.

Potassium:

- It helps in the formation of fruits and seeds.
- It helps in the process of photosynthesis.

- It enables plants to become resistance to diseases, drought and high temperatures.

Deficiency symptoms of certain important nutrients:

- Deficiency symptoms are signs which appear in a plant, due to the lack of a particular nutrient.
- The deficiency symptoms as a result of the lack nitrogen are:
(a) The leaves of the plant become yellow in colour.
(b) The growth of the plant becomes stunted or slowed down.
- The deficiency symptoms as a result of the lack of potassium are:
(a) There will be lodging in cereals.
(b) The tips and the margins of the leaves become yellow.
The deficiency symptoms as a result of the lack of phosphorus are:
(a) There will be stunted growth in the plant.
(b) The crops also will become stunted.

The minor nutrients:

- These refer to those nutrients which are needed in small amount for plant growth.
- They are also referred to as the micro nutrients.
- Examples are zinc, copper, iron and chlorine.

Signs shown by plants when they get enough nutrients:

- Their roots develop very well.
- Their leaves become broad.
- Their stem becomes thick.
- There is a high yield in crop production.

Signs shown by plants when they do not get enough nutrients:

- The growth of the plant becomes stunted.
- Parts of the leaves become yellow, with the other parts being green.
- The fruits fall prematurely.

- The crops mature at a slow rate.
- The leaves may fall prematurely.

Manure:

- There are two types of manure and these are:
(i) Inorganic manure. (ii) Organic manure.

Inorganic manure:

- They are usually referred to as fertilizers.
- Fertilizers are chemical plant food prepared by the agriculture scientist, which contain the major nutrients needed by plants.
- It is normally used or applied when the soil becomes poor in plant nutrients. -There are two types of fertilizers and these are
(a) Compound or mixed fertilizer.
(b) Simple or straight fertilizer.

Compound or mixed fertilizer:

- This is the type of fertilizer which contains two or more major nutrients.
- Examples are the N.P.K fertilizer and the N.P fertilizer.
- An N.P.K is a mixture of nitrogen, phosphate and potash.
- A compound fertilizer labeled 20:20:15 means that it consists of 20% nitrogen, 20% phosphate and 15% potash.
- Compound fertilizers are usually round in shape and ash in colour.

Simple or straight fertilizer:

-This is the type of fertilizer, which is made up of only one major nutrient.
- Examples are the sulphate of ammonia, supper phosphate and ammonium nitrate.
- It may be granular, powdery or crystalline in appearance.

Organic manure:

- This is the type of manure formed when dead plants and animal parts or remains are allowed to decay or decomposed.

- It includes compost, cow dung, poultry dropping and other farmyard manure.
- Organic manure in the form of compost can be made in many ways.
- In one method, a pit is dug and its bottom is lined with rocks to permit aeration and drainage.
- Plant materials such as leaves are placed into the pit as the first layer.
- The second layer is made up of animal manure such as cow dung, and a third layer of soil mixed with wood serves as the top layer.
- The whole heap is watered and turned every two weeks to improve aeration.
- The working temperature of the heap is tested by inserting a stick in it.
- If the stick is felt hot on removing, then decomposition is taking place.
- By the end of the sixth week, the heap would have bee decomposed into compost.

Advantages of applying organic manure:

(1) It makes the soil rich with plant nutrients.
(2) It loosens up the particles of compact soil particles.
(3) It puts together very loose soil particles.
(4) It maintains moisture within the soil.
(5) It checks erosion.

SOIL:

-This is the upper part of the earth`s crust, which serves as the main dwelling place of plants.

Formation of soil:

- Soil is formed from rock, and is formed whenever a rock breaks down or disintegrates into pieces.

- Some of the factors or conditions which can lead to the break-down of these rocks to form soil are listed next:

(a)– During a hot day, the sun heats the rocks causing them to expand.

- When the weather becomes cool especially during at night, the rocks cool and contract.
- This continuous heating and cooling results in the continuous expansion and contraction of the rocks, which results in the appearance of cracks and crevices within the rocks.
- These cracks and crevices leads to the gradual break-down or disintegration of the rocks to form soil.

(b) - Strong wind carries dust particles which on striking the rock surface, chops out particles of the rock to form soil.

(c) – When it rains, rocks are carried into running or moving water bodies such as rivers.

- Rocks being carried in running water knock against each other, which results in their break-down into soil.

(d) – Roots of plants which grow deep into rocks create cracks and crevices within them.
- These cracks and crevices later lead to the disintegration of the rocks.