Chapter Twenty

Plant Nutrients and soil:

Plant nutrients:

Plant nutrients are food used by the plant for 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:
  (i) The major nutrients.
  (ii) 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 and phosphorus.

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, i.e. it becomes small and grows at a very slow rate.
- Parts of the leaves become yellow, and the other parts become green.
- Their fruits and leaves may fall prematurely, i.e. they will fall earlier than expected.
- Their crops mature at a slow rate.

Manure:

- This is a kind of plant food, which we add to the soil so as to make it richer in nutrients.
- There are two types of manure and these are:

(i) Organic manure.
(ii) Inorganic manure.

Organic manure:

- This is the type of manure formed when dead plant and animal parts or remains, are allowed to decay or decompose.
- This type of manure includes compost, cow dung and poultry dropping.

Advantages of applying organic manure:

- It makes the soil rich with plant nutrients.
- It loosens up the particles of compact soil.
- It puts together soil particles which are very loose.
- It maintains moisture within the soil.
- It checks erosion.

Inorganic manure:

- These are usually referred to as fertilizers.
- Fertilizers are plant food in the form of chemicals which are made by man.
- They contain nutrients needed by plants, and they are usually applied when the soil becomes poor in 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.

Soil:

-This is the upper part of the earth`s crust, where plants mainly grow.

Formation of soil:

- Soil is formed from rock, and is formed whenever a rock breaks down or disintegrates into pieces.
- Rocks may break down to form soil in a number of ways and some of these ways

are listed next:
(a) – During a hot day, the sun heats the rocks causing them to expand.
- When the weather becomes cool, especially during the night, the rocks cool and contract.
- This continuous expansion and contraction of the rocks creates cracks in them, which lead to their breakdown into soil.
(b) When it rains, rocks are carried into moving water bodies such as rivers.
- As these rocks are being carried along by these water bodies, they knock against each other leading to their breakdown to form soil.
(c)- Strong wind carries dust particles.
- When these particles strike the surfaces of the rocks, they chop out particles of the rocks to form soil.

Composition of soil:

Soil is made up of the following parts or constituents:

(1) Rock particles.
(2) Soil water.
(3) Soil air.
(4) Living organisms.
(5) Organic matter.

Rock particles:

- This is the component or the portion of the soil, which is made up of broken down rock particles.
-They are also referred to as the mineral matter or the inorganic matter.
- These rock particles are of different sizes and shapes.

- They are important for these reasons:
  (1) Their different sizes and shapes create spaces for air and water to pass through the soil.
  (2) The living organisms within the soil live between these rocks particles.

- They provide some of the nutrients needed by the plant, such as calcium and iron.

Soil water:

- This is the name given to the water found within the soil.
- When there is too much water within the soil, the soil becomes waterlogged.
- Such a soil has all its air spaces filled with water, and plants cannot grow well in it.
- Such a soil can also be improved for the planting of crops by creating gutters in it, so as to enable the excess water to flow away from the surface.

- Soil water is important because:
  (1) It is needed for photosynthesis.