

SUBJECT: AGRICULTURAL SCIENCE

TOPIC: PLANT NUTRIENT AND NUTRIENT CYCLE

CLASS: SS2

WEEK: WEEK 8 AND 9

TERM: 1<sup>ST</sup> TERM

### PLANT NUTRIENT AND NUTRIENT CYCLES

Plant nutrients are classified into two, these include macronutrient and micronutrient.

#### MACRONUTRIENTS

These are mineral element or nutrients required by crops in large quantities. Examples are nitrogen, phosphorus, potassium, magnesium, calcium, and sulfur.

#### MICRONUTRIENT OR TRACE ELEMENTS

These are elements or nutrients required by crops in small quantities .required by crops in small quantities .examples are iron, copper, boron, molybdenum, iron chlorine and manganese.

#### FUNCTION AND DEFICIENCY SYMPTOM OF PLANT NUTRIENT S

S/N	ELEMENT	FUNCTION	DEFICENCY
1.	nitrogen	<div><div>I.</div><div>aids plant growth and reproduction.</div><div>II.</div><div>Promotes vegetative and short system growth</div><div>III.</div><div>Excess nitrogen delay maturation and fruiting</div><div>IV.</div><div>Promotes chlorophyll formation.</div><div>V.</div><div>Necessary for synthesis of plant hormones.</div></div>	<div><div>i.</div><div>Stunted growth</div><div>ii.</div><div>Yellowing of leaves</div><div>iii.</div><div>Leaves tend leaves to drop</div><div>iv.</div><div>Poor formation of fruits and flowers.</div></div>

S/N	ELEMENT	FUNCTION	DEFICIENCY
2.	Phosphorus	<ul style="list-style-type: none"> <li>i. It aid enzyme reactions</li> <li>ii. It is a constituent of cell division</li> <li>iii. Increase soil resistant to diseases</li> <li>iv. Helps in the ripening of fruits</li> <li>v. Helps in roots development and seed germination</li> <li>vi. Aids seed germination</li> </ul>	<ul style="list-style-type: none"> <li>i. Logging result in cereals crops</li> <li>ii. Stunted growth</li> <li>iii. Leaves turn purple and brownish in colour</li> <li>iv. Poor root development</li> <li>v. Immature fruit drop.</li> </ul>
3.	Potassium	<ul style="list-style-type: none"> <li>i. An important constituent of plant tissues</li> <li>ii. Aids synthesis of carbohydrates.</li> <li>iii. Promotes development of young plants</li> <li>iv. Activates various plant enzyme reactions</li> <li>v. Helps in nitrate uptake in the soil.</li> </ul>	<ul style="list-style-type: none"> <li>i. Weak slender stems</li> <li>ii. Delayed growth</li> <li>iii. Premature loss of leaves</li> <li>iv. Brown colour at margin of leaves.</li> </ul>
4.	Calcium	<ul style="list-style-type: none"> <li>i. Strengthen plant cell with calcium pectate</li> <li>ii. Helps in translocation and storage of carbohydrate and proteins in seeds and tubers</li> <li>iii. Necessary for normal growth of root tips</li> <li>iv. It controls toxicity of aluminimum,ma</li> </ul>	<ul style="list-style-type: none"> <li>i. Causes of colour at margin of leaves.</li> <li>ii. Weak slender plants</li> <li>iii. Pale yellow colour of leaves.</li> </ul>

		v.	nganese and sodium ions It improves soil ph		
5.	magnesium	i.	It is important in the synthesis of carbohydrate as it is a constituent of chlorophyll	i.	Cholrosis along leaf veins
		ii.	It assists in the transportation of phosphate for fruit seeds development	ii.	Stunted growth premature leaf fall.
		iii.	It enhances plant growth		
		iv.	It is required for normal cell division		
		v.	Necessary for the synthesis of soil plants.		

#### NITROGEN CYCLES

Nitrogen cycles refer to the circulation of certain nutrients like nitrogen carbon and water in nature.

The nitrogen cycle is nature way of regulating the amount nitrogen in the soil and air.

Ways by which nitrogen is added to the the soil in nitrogen cycle

1. Direct fixation by lighten during rainfall.
2. Incorporation into the soil by free living bacteria or non-symbolic bacteria.
3. Nitrogen –fixing bacteria in the the root nodules.
4. Decomposition of organic matter.
5. Application of nitrogen fertilizer.
6. Ammonification
7. Nitrification

Soil can gain nitrogen through the following ways:

1. Symbiotic nitrogen fixation
2. Electrical discharge
3. Non-symbiotic nitrogen fixation
4. Ammonification and nitrification

5. Application of organic manure and nitrogen fertilizers.

Ways by which nitrogen is lost from the soil are:

1. By denitrification
2. Soil erosion
3. Leaching
4. Soil ph
5. Bush burning
6. Crop removal
7. Volatilization
8. Oxidation
9. Reduction reaction

## CARBON CYCLE

This involves the series of processes which contribute to the circulation in nature.

Importance of carbon cycle

1. Plant use carbon dioxide obtained from the air to manufacture their food during photosynthesis
2. Provision of carbon which is the essential building block of all organic matters
3. Organic matter which is made from carbon helps to replenish soil nutrients.

## WATER CYCLE

This is the continuous movement of water from the atmosphere to the earth and from the earth to the atmosphere.

The atmosphere receives water through

1. Evaporation from oceans and land
2. Transpiration from plants
3. Breathing and respiration by plants and animals

Land receives water through

1. Rainfall and precipitation
2. Infiltration and percolation

Importance of water to the soil

1. Water provides the medium of absorption of minerals salts
2. It facilitates the transfer of nutrients to parts of plants.
3. It is an essential raw material during photosynthesis
4. It is a cooling effect on crops.
5. It helps in seed plant turgor or turbidity.

6. It is a constituent of protoplasm
7. It help in seed germination
8. It helps to sustain life.

#### ASSIGNMENT

1. List five importance of water to crops
2. List three forms of which water exist in the soil.