

SUBJECT: AGRICULTURAL SCIENCE

WEEK: 6

TOPIC: ENVIRONMENTAL PHYSIOLOGY

CLASS: SS2

Environmental physiology is the study of the interrelationship between an organisms physical functioning and its environment .it also encompasses plants physical functioning.

Environmental factors affecting agricultural production are:

- a. Climatic factor
- b. Biotic factor
- c. Edaphic factor

CLIMATIC FACTORS

Climatic is the average weather condition of a place measured over a long period of time.the climatic factor include:

1. Temperature
2. Sunlight
3. Wind
4. Rainfall
5. Relative humidity
6. Pressure
7. Radiant energy
8. Altitude

TEMPERATURE: This is the degree of hotness or coldness of a place at a given time.it is measured with thermometer. The effects of temperature on plant and animals include;

1. It affects the growth of plants
2. It is essential for the germination of seeds.
3. It is necessary for photosynthesis
4. It affects the distribution of plants and animals.
5. High temperature causes heat stress in pigs.
6. It also affects maturity to unfavorable to plants and animals.

SUNLIGHT: This is the light emitted by the sun.

- i. It affects the rising and roosting of animals.
- ii. It accounts for the opening and closing of the petals of certain flower.
- iii. Light is one of the major ingredients of photosynthesis.

- iv. It is necessary for the maturity and germination of seeds.

WIND: This is the air moving across the surface of the planet.

1. It affects the level of rainfall
2. Winds can evapo-transpiration in plants.
3. It is essential for the dispersal of fruit and seed.
4. It can cause serious damage to our crops in form of lodging e.g. wind storm.
5. Wind can spread diseases by distributing air-borne spores.

RAINFALL: This is the amount of rain that falls in a location over a period of time.

1. Rainfall supplies drinking water for animals especially desert animals.
2. It helps to dissolve soil nutrients
3. It is essential for the germination of seeds.
4. Too much of rainfall can lead to erosion.
5. Excessive rainfall can lead to leaching.

RELATIVE HUMIDITY: This is the amount of moisture in the atmosphere. The effects are:

1. Low relative humidity reduces heat in stress.
2. High relative humidity reduces evapo-transpiration in plants.
3. It helps in the distribution of crops.
4. Low relative humidity can reduce temperature leading to coldness.

BIOTIC FACTORS: They are determined by living organisms of the soil. They include predators, parasites, microbes, pest and diseases.

Parasites: they are either plants or animals affecting our crops and farm animals in a way that harms or is of no advantage to them. A parasites effect on the host also includes the following:

1. They transmit certain diseases to crops and animals.
2. They reduce the quality of farm produce like fruit, seeds, meat etc
3. They lead to the death of plant and animals.
4. They decrease the performance of animals.
5. They reduce the quality of yield.

Soil organism: these are organisms present in the soil. They can be micro and macro- organism like earth worm, millipedes, termites, etc. Some of their effects are:

1. Some cause diseases
2. Their activities can reduce the quality and quantity of crops.
3. They can help in soil formation.

Weeds: 1. they reduce the quality and quantity of crops.

2. They can act as host to certain crops pest.
3. They increase production cost as they cost farmers extra money and strength to control them.
4. They are difficult to control
5. The rate of growth of plant is reduced by the weed.

EDAPHIC FACTORS

These are soil factors. The major factors are the following soil concept:

Soil pH:

1. It determines the plants species that can grow in a habitat and how well they will cope.
2. It helps to distribute soil organisms.
3. It can cause plant and animals toxicity.
4. High acidity causes disintegration of clay minerals.

Soil texture: this is the fineness or coarseness of soil texture determines the relative proportion of sand, silt, and clay. Other effects include:

1. It affects drainage, capillarity and water retaining capacity of soil.
2. It also affects soil air.
3. The nutrients availability is also determined by its texture.
4. It affects infiltration and retention of water in the soil.

Soil structure: this is the management of the size and stability of soil aggregates. Soil structure contributes the following to plants:

1. It promotes plants growth
2. It determines water retaining capacity of the soil.
3. It also determines nutrients availability in the soil.
4. Soil structure can determine the fertility of the soil.

Topography: this is the physical shape of an area or land I relation to the underlying bedrocks of the earth surface.

1. If the soil is sloppy, erosion will occur and destroy plants.
2. It can aid weathering if the soil is steep and gentle
3. Flat slopes can lead to leaching of the soil nutrients.
4. An even or flat land can be good for cultivation.

