SUBJECT: AGRICULTURAL SCIENCE

CLASS: SS 1

WEEK: 7

TOPIC: AGRICULTURAL ECOLOGY

Agricultural ecology is defined as the study of crops plants and farm animals in their environment. Ecology is derived from a Greek ‘OIKOS’ which means home or dwelling place. In order words, agricultural ecology can be defined as a field of study which deals with relationship of organisms with one another and with the environment in which they live.

Agricultural Ecology is divided into;

1. Autecology
2. Synecology
3. Autecology is concerned with the study of individual organisms or a single species of organisms and its environment. For example the study of a single cattle and its environment.
4. Synecology is concerned with the study of the interrelationships between groups of organisms or species of organisms living together in an area. For example the study of different fishes in a fish pond in relation to their aquatic environment.

ECO SYSTEM: Eco system refers to a community of crops plants and farm animals functioning together with their non-living environment .In other words, the ecosystem consists of living factors (plants and animals) interacting with the non-living factors in a farm environment.

COMPONENTS OF THE FARM ECOSYSTEM

The farm ecosystem is made up of two main components these are;

(a)Biotic (Living) components

(b)Abiotic (non –living) components.

BIOTIC COMPONENTS includes the living things i.e. crops plants and farm animals. The biotic components can be grouped into two classes which are; Autotrophism and Heterotrophism.

1. Autotrophism: this is a group of organisms which makes use of sunlight or chemicals to manufacture their food from an inorganic substance during the process of photosynthesis. In other words, autotrophs are organisms mainly crops plants which are capable of synthesizing their food, hence they are called producers.
2. Heterotrophism: this is a group of organisms mainly farm animals which cannot manufacture their food but depends directly or indirectly on plants for their food, hence they are called consumers. Farm animals that feed directly on green plants (producers) are called herbivores or primary consumers e.g cattle, sheep, goat, and rabbits.

ABIOTIC COMPONENTS: The abiotic components of an ecosystem include the non-living things which are;

1. Climatic factors like rainfall, temperature, wind, humidity and sunlight.
2. Inorganic materials and nutrients such as carbon dioxide, oxygen, nitrogen, calcium and phosphorus.
3. Edaphic factors like soil, rocks, topography.
4. Other factors like dust, storms, fire, and water.

INTERACTION AMONG THE COMPONENTS OF AGRO-ECOSYSTEM IN SOME FARM SETTINGS

MONO-CROPPING/SOLE CROPPING: Mono-cropping is a system of cropping where one type of crop is grown on farm land at a particular time. For example oil palm farm, maize etc. The interaction between the biotic and abiotic factors in the environment includes;

1. A crops plant absorbs nutrients from soil to grow.
2. Crops plants also absorb water to grow and produce fruits.
3. A crops plant also takes in carbon dioxide from the air to carry out photosynthesis.

IN MIXED CROPPING SYSTEM: Mixed cropping is a system of cropping which involves the growing of two or more crops on the same piece of land at the same time. Crops like maize, cassava, cowpea etc. can be cultivated at the same time on the same farmland .their interactions includes;

1. Crops like cassava obtain nutrients from the soil to grow and produce fruits.
2. The leaves of all crops which fall on the ground decayed and add nutrients to the soil through decomposition by soil micro-organisms.

MIXED FARMING: Mixed farming involves the cultivation of crops and rearing of animals simultaneously on the same piece of farmland .the farm may be divided into two parts, one part for growing crops and the other part for growing grasses and keeping of animals. Their interactions include;

1. The grasses or the remains of crops serve as food for the animals.
2. The animals’ dungs and droppings are used as organic manure to improve the soil fertility for the crops.
3. Some crops like cowpea and crop residues may decay to release nutrients to the soil.

ASSIGNMENT

1. What is Agricultural Ecology?
2. Differentiate between autotrophs and heterotrophs
3. State five examples of climatic factors.