

SUBJECT: AGRICULTURAL SCIENCE

CLASS: JSS2

WEEK: 5

TERM: 3RD TERM

TOPIC: SOIL FERTILITY AND MANAGEMENT

SOIL FERTILITY

The soil is the greatest possession of the farmer. Therefore it has to be carefully managed to avoid extreme depletion of its resources. A fertile soil is a soil which contains all the soil nutrient elements in required by the plants in their correct form and proportion. Soil fertility is effectively managed when the following practices are adopted:

- (a) Crop rotation
- (b) Cover cropping
- (c) Inorganic fertilizer
- (d) Bush fallowing
- (e) Organic manures
- (f) Mulching

WAYS OF MAINTAINING SOIL FERTILITY

CROP ROTATION

Crop rotation is a term used to refer to the practice of growing different crops on a piece of land, in an orderly sequence, year after year.

PRINCIPLES GUIDING CROP ROTATION

For crop rotation to be effective, the following guidelines must be strictly followed:

1. Crops that have high requirement for particular nutrients should be followed by those that have light nutrients.
2. Shallow-rooted crops should be alternated with deep-rooted crops. This makes soil nutrient at different soil level more effectively used and still preserve soil structure.
3. Crops requiring different cultivation practices should follow one another.
4. A good rotation should include a fallow period of at least one year, during which the farmer plants leguminous cover crops on the land.

ADVANTAGES OF CROP ROTATION

1. It facilitates efficient and economic use of land from year to year.
2. It helps to reduce the risk of serious disease and pest infestation.

3. The planting of crops with different feeding habits reduces soil depletion.
4. The grasses and legumes in the rotation help to check erosion.
5. The legumes also enrich the soil by addition of nitrogen.

#### DISADVANTAGES OF CROP ROTATION

1. If not well planned, it leads to nutrient exhaustion and low productivity

#### BUSH FALLOWING

This is the practice of allowing the land to rest, after it has been cultivated for many years. The fallow or rest may be for 3-5 years. During this period, the land is able to rebuild its fertility.

#### ADVANTAGES OF BUSH FALLOWING

1. It is a simple, cheap and effective method of restoring soil fertility.
2. It helps to control build-up of harmful insect pest and diseases.
3. It is natural, and so does not involve large cash investment.
4. The decayed leaves form humus, thereby improving soil structure.

#### DISADVANTAGE OF BUSH FALLOWING

1. It can only be practiced where land is abundant.
2. The bush which is usually cleared by burning, after the fallow period, leads to loss of organic matter and burning of some economic trees.
3. It wastes land
4. Clearing the bush is laborious.

#### COVER CROPPING

This involves raising fast growing plants which tend to cover the soil surface and protect it from direct impact of sun and heavy rainfall. Legumes are mostly used for this purpose, because apart from covering the soil to suppress weed growth.

#### ADVANTAGES OF COVERCROPPING

1. They protect the soil surface from direct impact of rainfall and erosion.
2. They suppress weed growth.
3. They enrich the soil with fallen leaves and stems.
4. Leguminous cover crops enrich the soil with nitrogen.

#### ORGANIC MANURE

These are plant and animal residues which the farmer can add to maintain soil fertility. Organic materials added to the soil put back nutrients and improve soil structure.

#### TYPES AND CLASSES OF ORGANIC MANURE

There are three main classes or types of organic manure.

- (a) Green manure
- (b) Farm- yard manure or animal manure.
- (c) Compost manure

#### FERTILIZERS (INORGANIC MANURES)

Fertilizers or inorganic fertilizers are chemical substances, usually in the form of powders, granules, pellets or crystals, which are added to the soil to improve its fertility.

#### TYPES OF FERTILIZERS

Some nutrients or elements are required by crops in very large quantities, they are therefore called macro elements and include nitrogen (N), phosphorous (P), and potassium (K).

#### MULCHING

This is the practice of covering the soil with grass, crop residues, and straw, sawdust or ground corn cobs.

#### ADVANTAGES OF MULCHING

1. It prevents growth of weeds.
2. It conserves soil moisture.
3. It regulates soil temperature

#### DISADVANTAGES OF MULCHING

1. It can harbor crop pest.

#### ASSIGNMENT

1. Define the term 'organic manure'
2. State the classes of organic manure.

