

# **SUBJECT: AGRICULTURAL SCIENCE**

TOPIC: IRRIGATION

CLASS: SS2

WEEK FOUR (4)

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

Irrigation is the artificial application of water to the land for farming purposes.

Factors that determine irrigation system

1. Availability of water
2. The slope of the land
3. Soil type
4. Size of the farm land

Importance of irrigation in crop production

1. Irrigation softens the soil for tillage operation
2. It provides moisture in the soil for root absorption.
3. It reduces the amount of salt accumulated in the topsoil which could be injurious to the crops.
4. It cools the soil, thereby reducing soil temperature.
5. It enables crops to do well.
6. It increases crop productivity and yields.
7. It assists the production of crops all-round the year.
8. It is in microbial decomposition and nutrient release to the soil.
9. It dissolves soil nutrients for root absorption.

Negative effects of irrigation

1. It provides a humid environment which favours the buildup of pest and diseases.
2. It encourages the spread of weeds seeds.

Types of irrigation system

1. Surface irrigation
2. Sub-surface irrigation
3. Overhead irrigation

**SURFACE IRRIGATION**

In this system water from rivers, dams, or stream flows along surface of the land to the farmland. This can be in form of channels, flooding, contour ditch furrow, basin etc. This type of irrigation requires a gentle slope be successful.

#### Advantages of surface irrigation

1. It removes excess water caused by heavy rainfall.
2. It is easier to establish or setup
3. It is cheap to maintain.
4. It prevents the accumulation of alkali.
5. It increases activities of microbes in the too soil.

#### Disadvantages of surface irrigation

1. It cannot be practiced where land is hilly.
2. It cannot be successful in sandy soil.
3. The volume of water, especially in flooding may be difficult to control.
4. Some crops may not tolerate heavy flooding.

#### SUBSURFACE IRRIGATION

In this system water is applied below the soil surface.it involves the use of perforated pipes to deliver the water within the soil. This water gets to the root through capillary action.

#### Advantages of subsurface irrigation

1. It is possible to maintain water at optimum depth for crop need.
2. Water used efficiently.
3. It ensures low evaporation loses from the soil.
4. It does not create obstruction when carrying out cultural practices.

#### Disadvantages of surface irrigation

1. Water with high salt cannot be used.
2. It requires some level of expertise or technical know-how.
3. It is a bit expensive.

#### OVERHEAD IRRIGATION

In this system water is supplied to the farmland above the surface of the soil.

#### Problems associated with overhead irrigation

1. Wind can cause an uneven distribution of water by distorting sprinkler pattern.
2. The spray force can damage the ripening of soft fruits.
3. Stable water supply is needed for economic use of equipment.
4. The initial investment is usually high.

5. Power requirement for pumping water is high.
6. Requires technical know-how
7. It can spread diseases.
8. Lateral pipes hinder the movement of farm machines.
9. The high cost of maintenance, repairs and spare parts.

There are types of overhead irrigation;

1. Drip irrigation
2. Sprinkler irrigation

### SPRINKLER IRRIGATION

In this system, water is sprayed from the air and allowed to fall on the ground like rain through a nozzle under pressure.

Advantages of sprinkler irrigation

1. The amount of water supplied is regulated.
2. It economizes the use of water.
3. It is suitable for lands with high evapotranspiration rate.
4. It can be used for all crops except for tree crops.
5. Soluble fertilizers and herbicides can be applied through the irrigation water.

Disadvantages of sprinkler irrigation

1. Sprinkler irrigation is costly to operate
2. High wind velocity may prevent the distribution of water.
3. Stable water supply is required.
4. It requires high power to produce the high pressure needed to pump water into pipes
5. There is a lack of sufficient technical know-how on sprinkle irrigation.

### DRIP IRRIGATION

Drip irrigation is a method whereby water is discharged through nozzles called emitters or drippers at a selected spacing to deliver water to the soil surface near the base of the plant.

Advantages of drip irrigation

1. It is economical in the use of water.
2. It reduces salt concentration in the roots zone.
3. Fertilizer can be applied through the root system.
4. It operates with slower and arid areas.

Disadvantages of drip irrigation

1. It is very expensive to set up and maintain.

2. Water cannot be distributed in sloppy farmland evenly.
3. Water with high salt content can be used.

#### Problems associated with irrigation

1. Inadequate water supply for irrigation.
2. Irrigation equipment is expensive
3. Pests from surrounding may invade irrigated areas and damage crops
4. Disease-causing organisms increase with increased humidity.
5. Vectors like snails and tsetse flies breed freely in irrigation areas.
6. Lack of technical know-how.
7. It disturbs free movement of farm machinery.

#### How to reduce disease spread in irrigation

1. Use of disease resistant varieties.
2. Use of appropriate chemicals.
3. Crop rotation
4. Use of clean tools.
5. Destruction of infected crops to prevent the spread of disease.
6. Avoidance of excessive irrigation
7. Weed control

#### ASSIGNMENT

1. List five problems associated with irrigation.
2. List four things that can be done to reduce disease build-up in irrigation farmland.