College of Agriculture Engineering Sciences

Soil and Water Department (3rd stage)

2023-2024 **Irrigation System**

Mr. Ismae O. Ismael

Lecture (2)

Drip irrigation system

Drip irrigation is sometimes called trickle irrigation and involves dripping water onto the soil at very low rates from a system of small-diameter plastic pipes fitted with outlets called emitters or drippers.

Advantages of Drip Irrigation:

1. Maximum use of available water.
2. No water is available to weeds.
3. Maximum crop yield.
4. High efficiency in the use of fertilizers.
5. Low labor and relatively low operation cost.
6. No soil erosion.
7. Improved infiltration in the soil of low intake.
8. No runoff of fertilizers into groundwater.
9. Less evaporation losses of water

When to Use Drip Irrigation System

1. **Suitable crops**

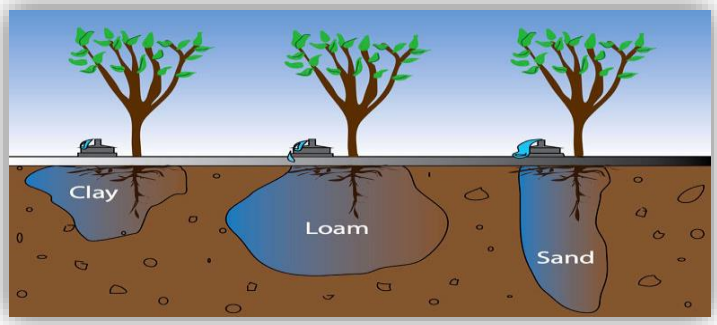
Drip irrigation is most suitable for row crops (vegetables, soft fruit), tree and vine crops where one or more emitters can be provided for each plant.

2. Suitable slopes

Drip irrigation is adaptable to any farmable slope. Normally the crop would be planted along contour lines and the water supply pipes (laterals) would be laid along the contour also.

3. Suitable soils

Drip irrigation is suitable for most soils. On clay soils, water must be applied slowly to avoid surface water ponding and runoff. On sandy soils, higher emitter discharge rates will be needed to ensure adequate lateral wetting of the soil.



4. Suitable irrigation water

One of the main problems with drip irrigation is the blockage of the emitters. All emitters have very small waterways ranging from 0.2-2.0 mm in diameter and these can become Emitter clogging

if the water is not clean.

Emitter clogging may also occur if the water contains **algae, fertilizer deposits, and dissolved chemicals that precipitate such as calcium and iron.** Filtration may remove some of the materials.

Emitter clogging is a major problem in drip irrigation systems, which may result from the isolated or combined effects of physical, chemical, and biological agents. **Clogging caused by suspended solid particles is the emitters.**

A typical drip irrigation system consists of the following components:

- Pump unit
- Control head
- Filter Unit
- Fertilizing Unit
- Main and submain lines
- Laterals
- Emitters or drippers.

- **The pump unit** takes water from the source and provides the right pressure for delivery into the pipe system.

- **The control head** consists of valves to control the discharge and pressure In the entire system. It may also have filters to clear the water.

- **The filter Unit** uses to clean the suspended impurities of water supplied by the pump before it reaches to drippers. Impurities in irrigation water may cause blockage of the holes drippers.

- **Fertilizing Unit** The direct application of fertilizer through drip irrigation has increased the efficient use of fertilizer and saving in labor and money.

- **Mainlines, subdomains, and laterals** supply water from the control head into the fields. They are usually made from PVC or polyethylene hose and should be buried below ground because they easily degrade when exposed to direct solar radiation.

- **Emitters** or drippers are devices used to control the discharge of water from the lateral to the plants. They are usually spaced more than 1 meter apart with one or more emitters used for a single plant such as a tree.