

Pressurized Irrigation Methods

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INTRODUCTION:

Pressurized irrigation methods include both sprinkler and drip irrigation methods where water is applied through network of pipelines by means of pressure devices.

Sprinkler Irrigation method:

The sprinkling or spray of water is made by pumping under pressure through network of pipelines and allowing to eject out by means of small orifices or nozzles. In this method the irrigation water is sprayed to the air and allowed to fall on-the ground surface more or less resembling rainfall.

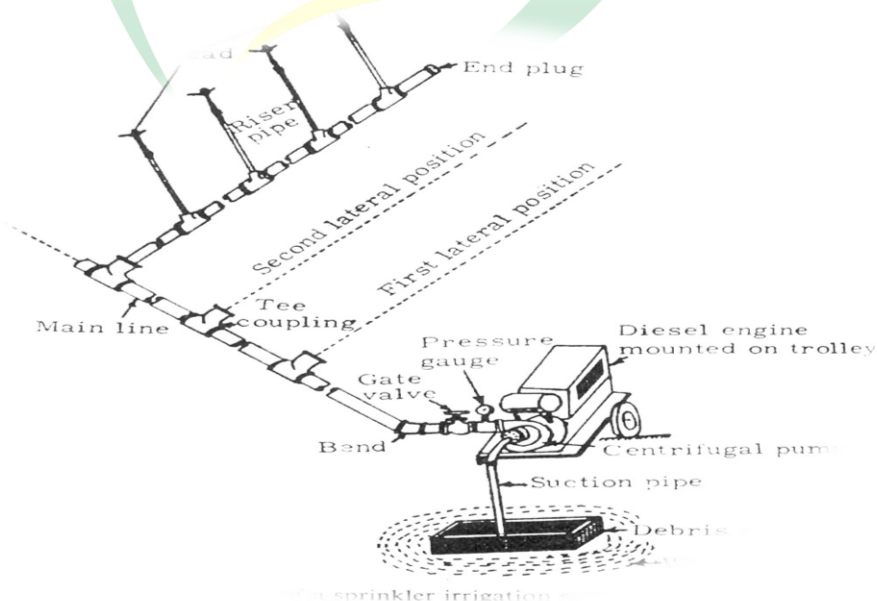


Fig : Components of sprinkler irrigation system

The water required by the crop is applied in the form of spray by using some devices, wherein the water application rate should be somewhat lesser than the soil infiltration rate to avoid run off or stagnation of water in the field.

Major Components of Sprinkler Irrigation System

- Pump set
- Network of pipes lines (Main, lateral, sub lateral, etc.)
- Riser pipes with tripod stand
- Sprinkler head

Sprinkler selection and Spacing:

The choice depends on diameter of coverage required, pressure available and discharge of sprinkler. The data given in tables 1 and 2 may serve as guidance in selecting the pressure and spacing desired.

Maximum Spacing of Sprinklers under windy Condition

Average speed of wind	Spacing
No wind	65% of the diameter of the water spread area of sprinkler
0 – 6.5 km/hr	
6.5 – 13 km/hr	60% of the diameter of the water spread area of sprinkler
Above 13 km/hr	50% of the diameter of the water spread area of sprinkler
	30% of the diameter of the water spread area of sprinkler

Suitability and Advantages of Sprinkler Irrigation method

- It is more suitable for sandy soil where infiltration rate is high.
- Suitable for shallow soil where leveling is not possible.
- having undulating topography or steep slopes of lands where leveling is economically not advisable.
- Irrigation steam size is very small where surface flow is low.

- It is almost suitable for all crops except crops like rice, which needs stagnation of water, but under water scarcity it can be tried for rice also. For cotton during reproductive phase sprinkler irrigation is not advisable.
- Application of fertilizer (fertigation), pesticides (pestigation) and herbicides (herbigation) are possible through irrigation systems which reduce labour cost and increase the use efficiency of any chemical.
- It controls crop canopy temperature
- In crust soil, it facilitates early germination and establishment by means of light and frequent irrigation.
- Wastage of land for basin, ridges and furrows and irrigator channels are reduced.

Drip or Trickle Irrigation System /Line source irrigation:

Water is applied through net work of pipelines and allowed to fall drop by drop at crop root zone by a special device called emitters or drippers. These drippers or emitters control the quantity of water to be dropped out. In this system, the main principle is to apply the water at crop root zone based on the daily Evapotranspiration demand of the crop without any stress. Hence, the root zone is always maintained at field capacity level

Components of the Drip Irrigation system

- Overhead tank or pressure system (Motor pumps.)
- Main Lines
- Sub main
- Laterals
- Emitters

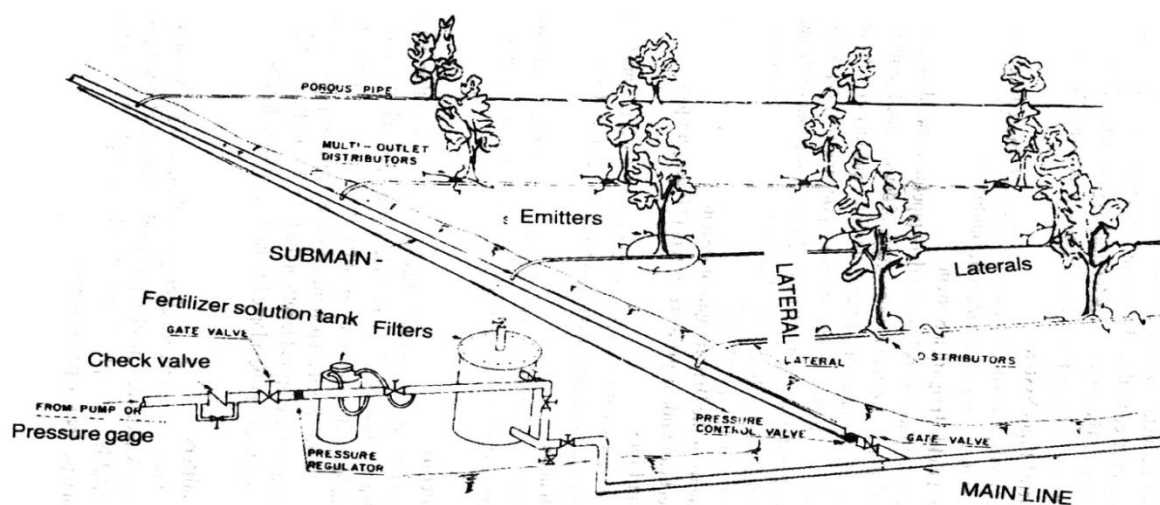


Fig : Components of Drip Irrigation System

Advantages

- ✓ Application of water in slow rates facilitates the easy infiltration into the soil
- ✓ The required quantity of water is applied near the root zone alone which in turn save water.
- ✓ The root zone is always maintained with field capacity level and hence plants do not suffer water stress.
- ✓ There are no seepage or percolation or evaporation losses.
- ✓ Weed growth is restricted due to limited area of wetting zone.
- ✓ Fertilizers (fertigation), chemical like pesticides (pestigation) and herbicide (herbigation) can be applied through irrigation. Hence, saving of input quantity and labour cost besides increase in their use efficiencies is possible.
- ✓ Reduce the salt content near the root zone and dilute it in saline soil.
- ✓ The saline water also can be put under use if irrigation is applied through drip irrigation
- ✓ It can be adopted for any type of topography
- ✓ Yield increases due to optimum maintenance of soil moisture at root zone.
- ✓ More area can be maintained with little quantity of water.
- ✓ It can be used for widely spaced crops like Cotton, Sugarcane, tomato, brinjal, coconut and orchard crops.