

Sprinkler Irrigation

- Application of water in form of spray
- More efficient method than surface
- Advantageous when –
 - Land cannot be prepared for surface methods
 - Slopes are excessive
 - Topography is irregular
 - Soil is erosive
 - Soil is excessively permeable/impermeable
 - Depth of soil is shallow over gravel/sand.
- Large investment: pumping, distribution sets
- Classification
 - Permanent: pipes are buried & no interference to agricultural process
 - Semi-permanent: main lines are buried, laterals are portable
 - Portable: main & lateral lines are portable

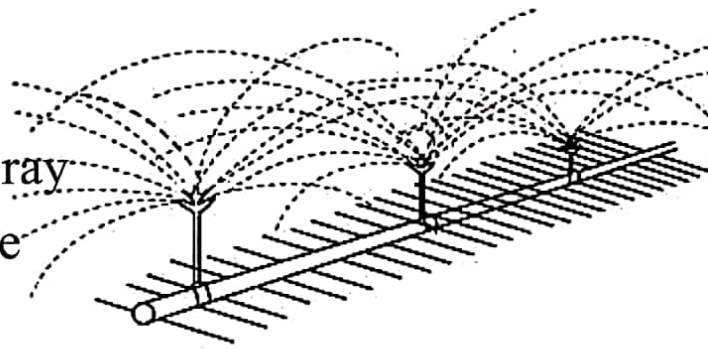


Fig. 6.6. Sprinkler irrigation

Types of Sprinklers

- Fixed nozzle pipe system
 - 15 m apart
 - By turning pipes through 135° entire width of 15m can be covered
- Perforated pipe system
 - Spacing at 6 to 15 m
- Rotating sprinkler system
 - Discharge required through each sprinkler is given by

$$q = \frac{S_l \times S_m \times I}{3600}$$

where, q: discharge required (l/sec)

S_l : spacing of sprinklers along laterals (m)

S_m : spacing of laterals along mains (m)

I : optimum water application rate (mm/hr)

- Efficiency of water application (η_a) is given as -

$$\eta_a = \frac{W_s}{W_f} \times 100$$

- W_s : irrigation water stored in root zone'
- W_f : water pumped into system
- About 80% efficiency can be achieved with sprinkler

Advantages	Limitations
Erosion can be controlled/reduced	Wind may distort system
Uniform application of water	Constant supply is needed
Irrigation is better controlled Light irrigation: when seedling & young plants	Heavy soil, poor intake cannot be irrigated
Land preparation is not required	Power requirement is high
Larger area available for cropping	Water must be clean
Small streams can be used efficiently	
Controlled application of fertilizers	