



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution, Affiliated to Anna University)

Coimbatore – 641 035.



Irrigation Scheduling

Irrigation Scheduling : Supply of water in optimum quantity at right time with appropriate application method is called irrigation scheduling. It enable irrigator to apply exact amount of water ; increases irrigation efficiency. There is accurate measurement of the volume of water applied or depth of application.

Advantages

1. It enables the farmers to schedule water rotation among different fields to minimise water stress and maximise yields.
2. It reduces cost of water and labour through fewer irrigations, thereby making maximum use of soil moisture.
3. Save fertilizer costs by reducing run off and leaching losses.
4. Increases net returns by increasing yield and crop quality.
5. It minimises water logging problems.
6. It assist in controlling root zone salinity problems through controlled leaching.
7. Additional returns by using saved water.

Factors influencing irrigation schedules

1. Soil
2. Plant
3. Climate
4. Managements

When to irrigate

1. Maintanance of soil moisture around field capacity is ideal for many crops.
2. As the soil moisture tension increases crops can't extract needed moisture for optimum growth.

-
-
3. Crop starts wilting leading to retard growth and permanent wilting.

4. Crop should not experience moisture stress between two irrigations.
5. By knowing ASM in crop root zone and ET demand, irrigation need can be determined.

Approaches for scheduling irrigation

1. Soil moisture monitoring

- (i) Measurement of soil water potential by tensiometer or gypsum blocks etc.
- (ii) Soil moisture content by direct methods (gravimetric)
- (iii) Feel and appearance method.

Atmospheric measurements and water balance technique

- (iv) Measurement of crop evapotranspiration (ET_c)
- (v) IW/CPE approach
- (vi) Lysimeter studies
- (vii) Field water balance

2. Plant based monitoring

(i) Contact methods

- a. Measuring plant-water status by pressure chamber, Dew point hygrometer, osmometer, tissue water content.
- b. Measurement of plant response by sap flow sensors, stomatal conductance (porometers) and plant growth rate.

(ii) Non contact method

- a. Site specific crop management and irrigation
- b. Plant spectral responses
- c. Radiometric sensors

- Multispectral sensors
- Hyperspectral sensors
- Thermal sensing

iii) Plant Indices

1. Visual symptoms
2. Soil cum sand miniplot
3. Plant population
4. Growth rate
5. Indicator plants
6. Critical growth stages .

Delta vs Duty

Delta is the total depth of irrigation to a crop in centimeters. It can be calculated by dividing the volume of irrigation water by the area irrigated.

Duty is the ratio between irrigated area and quantity of water used. It is expressed in litres per second per ha and indicates the flow requirement per hectare of cropped area.

(Refer PPT for the water requirement of individual crops and Evapotranspiration document file)