

Irrigation for Profit

Centre Pivot Irrigation – Scheduling

Introduction

Irrigation scheduling is the process of determining when an irrigation event should occur and ultimately how much water should be applied. Poor scheduling may lead to a waste of water, energy and labour, low yields and environmental problems. Good scheduling should optimise yield and quality, while making efficient use of resources.

Scheduling for centre pivots is unique compared to other irrigation systems. Irrigation involves light, frequent applications that match the plant water use (typically 25 – 50 mm/pass).



Scheduling Factors

There a number of factors that should be considered when scheduling irrigation for centre pivots:

- Crop water use;
- Soil water holding capacity and crop root depth;
- System capacity; and
- Climate, management and cultural practices (including chemical and fertiliser application, tillage, harvesting and grazing).

Crop Water Use

Crop water use can be measured by:

- Apparent soil moisture measuring equipment, which indicate the relative available soil water; and
- Calculations from evaporation data given the appropriate crop factor.

Soil Water Holding Capacity

Soil water holding capacity determines the amount of water that can be stored in the crop root zone and is available for plant uptake. A deep-rooted crop on clay soil has significantly higher soil water holding capacity compared to a shallow rooted crop in sandy soil.

Soil water holding capacity will determine the maximum amount of water that can be applied in an irrigation event.

System Capacity

If system capacity is greater than the peak crop water requirement, scheduling can be managed based on the crop water use. For under-designed systems, scheduling may involve soil moisture banking where the root zone is kept near capacity. In times of peak crop water use, the water stored in the root zone supplements the deficit in irrigation application.

Climate, Management and Cultural Practices

Scheduling may involve smaller applications when rainfall is forecasted to minimise water logging. Non-irrigation periods should be considered and may require soil moisture banking. Consideration should also be given to inefficiencies in distribution and application.