IRRROMETER

Irrigation Scheduling

by Crop Demand
Irrigation Scheduling Methods
Tradition Method
Calendar Method
Observation Method
Feel Method
Scientific Method
Demand Method
Where Does The Water Go?

- Run-off
- Evaporation
- Deep percolation
- Root Zone.
Idealized soil water extraction pattern.

Water Extraction Chart

40%
30%
20%
10%
Water Holding Capacity

- **Saturation**
- **Field Capacity**
- **Wilting Point**

- **FC**
- **50% MAD**

0 to 1500
33 to 80

IRROMETER
Optimising irrigation... Minimising conservation... WOLLONGONG - Since 1951
Agronomy Journal Water Retention Curves

Loam soil
50% depletion
85 cb
What Is

SOIL WATER TENSION?
Big Gulp Principle
Low Soil Water Tension

High level of soil moisture means a low level of root suction
High Soil Water Tension

Low level of soil moisture means a high level of root suction
Field Capacity
Technology Options

- Two sensor types
- Manual data collection
- Automatic data collection
- Remote data collection
- Automation.
IRROMETER’s

- Tensiometer/direct method
- Not affected by:
  - Water quality
  - Soil temperature
  - Soil types
- Simple & reliable
- Manual or automatic
- Control Systems.
WATERMARK Sensors

- Low cost
- Works in most soils
- Indirect method
- Salinity buffering
- No freezing
- Soil temperature
- Manual or Automatic
- No maintenance
- Stable proven calibration.
WATERMARK = Tensiometer?
WATERMARK
“on a stick”
Handheld Meter Reading
Automatic Data Collection
900 Monitor

- 8 Sensor Inputs
- Sensors wired directly
- User Programs
  reading intervals
- 9V battery powered
950 Wireless Monitor

- 64 sensor inputs
- Eliminates field wiring
- Saves installation time
- 1500 ft. (457 m) range.
WaterGraph Software
Remote Data Access

- Brings data to user
- Long Range Radio
- Cellular Gateway
- Satellite Modem
- Battery power with solar charging.
Web Based Services

- Users can view data on any Internet connected computer
- Web Reporting Service (WRS)
- Cellular Data Service (CDS)
- Satellite Data Service (CDS)
WEB Based Data Display

- Data automatically collected
- Password protected
- Worldwide access to data.
Sounds great…
but how much does it cost?
Senor Placement

- Two sensors placed at different depths = one sensing station
- One sensing station per 10-20 acres
- 60 acre field.
Sensor Placement

15 acres

15 acres

15 acres

15 acres
Cost per Acre Over Five Years
(Monitoring 60 acres with a five year product life)

$ \text{IRROMETER instruments} = $2.23

$ \text{WATERMARK’s with Hand-held Meter} = $1.81

$ \text{WATERMARK’s with 900 Monitor} (\text{wired}) = $2.21

$ \text{WATERMARK’s with 950 Wireless Monitor} = $5.67.$
How much does it cost?

The real question is how much are you going to save?
Soil Solution Access Tube (SSAT)

- Collect soil water samples
- Simple
- Inexpensive.
Agricultural Design Guide

Moisture Sensor
Agricultural Irrigation Design Manual

Typical Irrometer or Watermark Placement - 130 Ac. Center Pivot

Alternate I

Alternate II

Pivot travel direction

Always use two (2) Irrimeters or Watermarks per location, one shallow and one deep.

Notes:
- Set shallow sensors at approx. 25% of the crop rooting depth.
- Set deep sensors at approx. 75% of the crop rooting depth.
- Sensors near start and finish positions should be a few sprinkler diameters away from the actual start/finish line.

Irrimeters or Watermarks on Center Pivot 10/24/05
Questions?