Information Sheet

IS13027

Irrigation scheduling tools - capacitance probe

Capacitance probes measure soil-water content by detecting how easily an electric charge travels through the soil. In continuously logged systems (for example, EnviroSCAN and AquaSpy) the sensors are connected to a data logger by cabling or radio frequency.

A capacitance probe consists of multiple sensors to take measurements at various depths. In continuously logged systems the probe is connected to a data logger that records moisture variation at each sensor at regular time intervals. These measurements can be analysed separately or combined to determine the moisture availability. The trends that are logged are used to determine optimal irrigation scheduling.

Rainfall and irrigation events are automatically recorded along with an indication of daily crop water use.

Scheduling

Scheduling using a capacitance probe is based on the daily moisture change. Daily moisture change is an indication of the plant's ability to extract moisture. Moisture extraction will peak after an irrigation and then gradually slow down. The example graph shows the variation in soil moisture extraction over time. Extraction rates are higher during the day and reduce at night. By monitoring the daily extraction, and maintaining an appropriate soil moisture level crop yield losses can be minimised.

Note: Capacitance probe deficit figures are not a measurement of actual soil moisture deficits. They can only indicate when to irrigate, not how much water to apply.

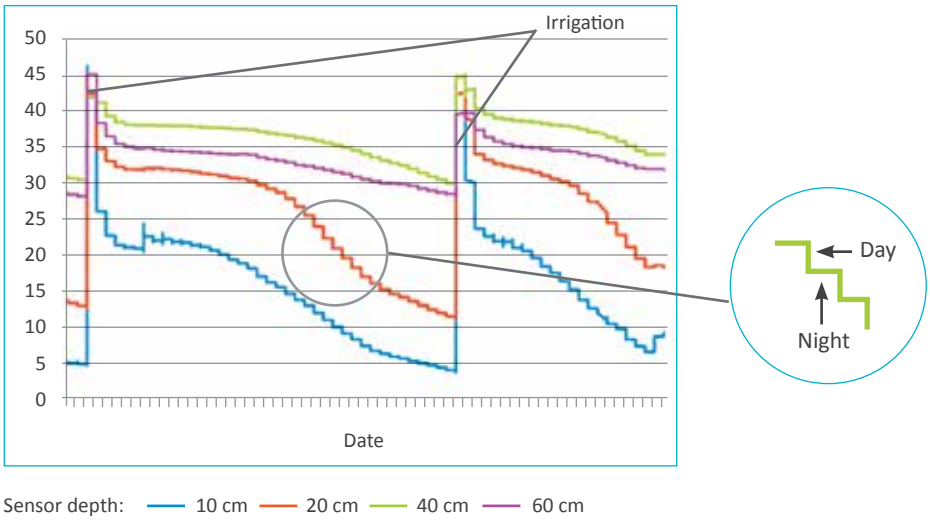
Placement

A capacitance probe measures a small area around the sensor with the majority of the information being gained from within a 5 cm radius. This small sphere of influence means that correct placement is important.

Probes should be placed:

- In the field's most common soil type.
- Away from an area that is over or under watered (too close to the top or too close to the bottom).
- Away from an area that may have an edge effect (an area that is next to an excessively dry area or an area that may have water moving in from the next paddock being irrigated).
- Where it can easily be accessed for retrieval at the end of the season.
- In the hill close to a stand of actively growing cane.

Above: Capacitance probe.



Right: Example capacitance probe graph.

Sugar Research Australia

RURAL WATER USE EFFICIENCY IRRIGATION FUTURES

CANEGROWERS