WEL SOIL MOISTURE METER

Save money and time by not irrigating unnecessarily.

Avoids nutrient leeching by preventing over irrigation.

Cost effective probes are lower in cost than their mechanical counterpart.

Low Maintenance probes plant in the ground and forget.

Irrigation watering times become predictable as the results of the readings allow the user to “see” the amount of water able to be held by the soil and how much the plant is using.

WEL
Willowbank Electronics Ltd www.willowbankelectronics.co.nz ph 06 844 1079

WILLOWBANK ELECTRONICS LTD
SOIL MOISTURE METER

Operation

- Press the power button for >1 second to turn on the meter.
- Clip the meter test leads to each terminal of the probe. Either way will give the same reading.
- Turn the knob to set the approximate soil temperature, wait for the meter to display a stable reading (approx 2 secs).
- The meter will automatically turn off after 2minutes without use. Alternatively, press the power button for >2 seconds to turn off manually.

NOTE: Battery in meter should be changed at the beginning of each season.

Specifications

Reading Range	0 to 199 centibars (kilopascals)
Supply Voltage	9-volt battery
Current Consumption	<10 mA
Operating Temperature	-10 to 60 degrees C
Storage Temperature	-10 to 60 degrees C

Soil Suction Reading Guidelines

It should be understood that the figures that are given are only a guide to give the user some idea of approximate suction levels. These figures should be used in relation to the crop being grown and in conjunction with your technical adviser.

Saturated Soil	0–2 centibars
Adequate Moisture Level	2-50 centibars depending on soil water holding capacity.

Irrigation required for:	
Coarse Sands and Gravels	>15 centibars
Fine Sands	>30 centibars
Sandy Loams & Clay Loams	>40 centibars
Silt Loams	>50 centibars

Meter Testing

This meter may be checked for calibration by using the resistor attached to the battery lead. (Slide the battery cover on the rear to expose battery and lead). Clip the meter test leads to the 2 wires protruding from the resistor, set the temperature knob to “24”C. The meter should read between 90 & 105. If the reading falls outside of this range, check the battery. If the battery is OK, the unit should be returned for servicing.

Warranty

Willowbank Electronics Ltd warranties this product against manufacturing and electrical defects for a period of 12 months from date of purchase.
No claim shall be recognised without full proof of purchase being forwarded with the unit.
Warranty does not include battery or damage due to misuse.
In the event of service being required, the unit should be sent postage paid to:

WILLOWBANK ELECTRONICS LTD.
1419 KOROKIPO ROAD
RD3, NAPIER
NEW ZEALAND
www.welnz.com

SOIL MOISTURE PROBE INSTRUCTION

(WATERMARK 200 TYPE PROBE)

OPERATING AND INSTALLATION SOIL MOISTURE MEASUREMENT

The soil acts as a reservoir to store water between irrigations, or rainfall, so that it is available to the crop or plants as needed for healthy growth. The purpose of using the sensors to measure the soil water is to give you a better understanding of how fast it is being depleted in the different areas of your field, so you can schedule your irrigations and correctly evaluate the true effectiveness of any rainfall. By reading your sensors 2-3 times between irrigations, you will gain an accurate picture of progress over time, and develop an irrigation scheduling pattern to meet your corps "need ~for water. This eliminates the guesswork, and can result in water savings, lower pumping costs and the elimination of excess leeching of nitrogen due to over irrigation.

Locating Sensors

Sensor Stations for Tree Crops:

With sprinkler irrigation, there is usually more uniform distribution of water to the ground surface, but there can be great differences in penetration and holding capacity due to soil type variations, soil sensors at the drip line, in row crops right in the plant row. Be sure that the sensors are not located behind obstructions, such as tree limbs, which could interfere with the water distribution to the sensor area.

With drip or micro irrigation, sensors must be located in the wetted area from the emitter. For drip emitters this should be at half the wetted radius which varies according to the flow rate of the dripper and infiltration rate of the soil; the higher the flow rate the larger the wetted radius and the slower the infiltration rate the larger the wetted radius. Sandy soils with rapid infiltration have a small wetting radius while other soils with slow infiltration have a large wetting radius.

With Micro sprinklers or sprays, usually 600mm-1mtr from micro-sprinklers is best. Monitoring often enough should give you a good overall picture of the irrigation block, and consider the variations;
Lighter soils dry very quickly, heavier soils dry more slowly, but **both must be considered.**

Managing Your Irrigation

The key element is **YOU.** Taking the time to read sensors 2-3 times between irrigations, this will give you a vivid picture of what is happening with your soil moisture down in the root system of your crop. You can plot these readings onto a chart for each sensing station and the resulting soil moisture curves will soon show exactly how quickly (or slowly) soil moisture is being depleted.

IMPORTANT:

Installation Procedure:

1. Soak the sensors overnight in irrigation water. Allow sensor to dry for 1-2 days after soaking, and repeat the soak-dry cycle twice to improve the sensor. Soak for a third time for at least 1 hour, plant the **"WET"** Sensor in the soil.
2. Always install sensors in the active root system of the crop. Make a sensor access hole to the depth required with a 20mm rod. For very coarse or gravely soils an oversized hole may be required to prevent damage to the sensor. Carefully backfill the access hole with soil to eliminate any air pockets.
3. Snug fit in the soil is the most important. Lack of a snug fit is the No. 1 problem in sensor effectiveness. The ideal method of making the access hole is to use a 22mm diameter auger.
4. When removing sensors prior to harvest in annual crops, it is a good idea to do this just after the last irrigation (the soil will be moist). Careful removal prevents sensor and sensor membrane damage, you may have to dig it out.
5. When sensors are removed for winter storage, clean sensors, dry them and place them in a plastic bag.
6. In perennial orchards the sensors can be left in-situ.

Wiring for Sensors

If additional wiring is to be used to allow reading the sensor from the field edge, or next to a tree, simply splice additional wire on the sensor wire. The wire splice should be fully waterproof. The wire can be extended up to 300mtrs. Avoid long wire runs near power cables. The transient currents can affect the small current used by the digital moisture metre. This can be checked by reading the sensors at both ends of the wire run.

The most common problems in the field are:

1. The sensor does not have snug fit in the soil. This usually happens when an oversized access hole has been used and the backfilling of the area around the sensors is not complete.
2. The sensor is not in an active portion of the root system, or the irrigation is not reaching the sensor area. This can happen if the sensor is sitting on top of a rock or below a hard pan, which may impede water movement. Re-installing the sensor usually solves this problem.
3. When the soil dries out to the point where you are seeing readings higher than 80 centibars, the contact between the soil and sensor can be lost, as the soil shrinks away from the sensor. An irrigation which only results in a partial rewetting of the soil (soil suction above 40 centibars), will not fully re-wet the sensor, which can result in high readings from the sensor. Fully re-wetting the soil and sensor usually restores soil/sensor contact. This is most often seen in the heavier soils, and during peak crop water demand when irrigation may not be fully adequate. The plotting of readings on a chart is most useful to get a 'good picture' of this sort of behaviour.