Section 7 of 22 (7h - Tensiometers and Electrical Resistance Blocks)

Background. **Electrical Resistance Blocks (ERB) and Tensiometers haves stood the test of time for accuracy, simplicity, and reliability as real-time methods to determine soil moisture.**

The first generation ERB is perhaps better known as the gypsum block. This device, while able to measure soil tension up to about 200 centibars (cb), tends to dissolve in the soil and thus lose accuracy. A more recent ERB, also known as a granular matrix sensor, is also calibrated to give soil moisture meter readings in cb's. It has proven itself to maintain calibration for extended periods of time. The ERB is set at the depth in the soil where the moisture level is to be measured.

Tensiometers from the various manufacturers' measure soil moisture tension with a vacuum gauge. A ceramic-tipped probe is set at the depth where the moisture measurement is desired.

Installation. As with the ERB, tensiometers are generally placed at several depths within the root zone in order to get a more accurate understanding of irrigation requirements. Each manufacturer has specific guidelines to prepare the moisture measuring devices for installation, the actual installation process, and sensor maintenance. Once the devices are prepared for installation, the location and depth of the sensor needs to be determined. **(See example on next page.)**

1. **Location of the sensors in the field mainly depends upon the type of irrigation, the size of the field, the variability of the soil, and the depth of the soil. They should be placed so as to represent the crop and soil in the locale in which they are located. They should also be located where they are accessible for reading and out of harms way, particularly from farm equipment.**
2. **Sensors should be placed at different depths at a location to reflect the root zone of the crop being grown. Usually two and sometimes three sensors are needed to properly monitor soil moisture in the root zone.**
3. **A hole for the sensor can be prepared with a rod the same diameter as the sensor, driven into the ground. A preferred method is to extract a soil core of approximately the same diameter as the sensor. This method precludes-compaction of the soil immediately surrounding the probe and thus provides a more representative reading.**
4. **The sensors must be "seated" in the profile. This is accomplished with slurry made from the soil removed from the hole, and placed in the hole with the probe.**

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Soil moisture measurement is the key to Irrigation Water Management.

Agronomy Tech Note 76 (http://www.nm.nrcs.usda.gov/technical/handbooks/iwm/nmiwm.html)