Field Estimation of Soil Water Content: A Practical Guide to Methods, Instrumentation and Sensor Technology


Blaine Hanson*

The purpose of this manual is “to provide guidance for field scientists who are not instrumentation experts but who wish to determine soil water content as part of their work.” It is targeted at those conducting projects in developing countries.

The first chapter covers basic information on soil water content and on measurement accuracy, precision, and calibration. The remaining chapters discuss various types of soil water–tension sensors ranging from gravimetric and volumetric soil sampling, tensiometers, electrical resistance sensors, and neutron moisture meters to the more complex dielectric sensors such as TDR systems, TRIME system, capacitance sensors (Diviner 2000, Environscan, Delta-T PR1/6), and the CS616 water content reflectometer. In general, the first section of each chapter on sensors describes the equipment, including a list of sensor manufacturers, measurement general principles, and information on accessories, documentation, and software. The next section provides detailed information on sensor installation and includes a “hints and tricks” discussion to alert readers to some practical considerations in using a particular sensor. A third section addresses taking readings, while a fourth section discusses sensor calibration.

I found the manual to be well organized and well written. It provides in-depth information on the use of various sensors that will be highly useful to those measuring soil water content and tension. Although it is directed toward the scientific community, the information in the manual should be useful to private consultants, irrigation district personnel, and other government agency personnel involved in farm-level irrigation water management.