## Sensors for Soil Profile Moisture Measurement Compared. (S01-evett170153-Oral)

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## Abstract:

Measurements of soil profile water content are necessary for crop water use determination and measurement of soil water dynamics. We compared the Sentek EnviroSCAN and Diviner 2000 capacitance devices, the Delta-T Profiler capacitance probe, the Trime T3 tube-probe, a prototype TDR tubeprobe, and the neutron probe against conventional TDR and mass balance measurements of soil water content. Except for conventional TDR, the devices can be used in access tubes. Experiments were conducted in triplicate repacked columns of three soils: a silty clay loam, a clay, and a calcic clay loam (50% calcium carbonate). Each 75-cm deep, 55-cm diameter column was weighed to 50 g precision. Soil temperature was measured at several depths in each column. Depth resolution of each device was investigated by lowering its probe from a height 30-cm above the soil surface and taking measurements at 2-cm increments until the probe was 30-cm below the soil surface (for air dry and saturated conditions). Comparisons of soil water content reported by the devices vs. soil temperature were made (air dry and saturated). Measurement precision of the devices was investigated by repeated measures through time.

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## **Presentation Information:**

Presentation Date: Wednesday, November 13, 2002 Presentation Time: 2:30 pm

## **Keywords:**

water content, time domain reflectometry, capacitance, neutron probe