A Resistance-Based Sensor for Detecting Wetness at the Soil-Air Interface. (A03-osborne103355-Oral)

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Abstract:

Soil wetness at or just below the soil-air interface is thought to be a very important factor in soil biological and physical processes. Methods of measuring wetness in this zone are limited. A resistance-based sensor was created to intermittently monitor soil-surface wetness over time and to be used with data logging equipment. A sensor was developed and tested in the laboratory and under field conditions. Sensors were tested for consistency and durability through replicated trials conducted on synthetic sponges and on thin soil layers. In the greenhouse, sensors were calibrated against tactile estimation of wetness on thin layers of three soil types: sandy loam, clay loam, and silt loam, over a range of known moisture levels. Field trials were then conducted to test sensor durability and response to field environments. Sensors were consistent in their response to wetness over replications, but significant variability among sensor output was noted. After calibration values were determined using tactile estimates of wetness as a standard, all sensors were able to correctly estimate wet vs. dry conditions (compared with tactile estimates) both in the laboratory and field trials.

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