Measuring In Situ Soil Water Potential Using a Sintered Glass Matrix. (S01-campbell163328-Poster)

Authors:

- C.S.Campbell* - *Decagon Devices, Inc.*
- G.S.Campbell - *Decagon Devices, Inc.*

Abstract:

Availability of water in soil is one of the most important parameters for plant growth. Over the years, many techniques have been developed to quantify in situ water potential, but most are limited by low accuracy, poor durability, or the need for individual calibration. The objective of our study was to determine if a frequency domain reflectometer overlaid with a sintered glass matrix of differing pore sizes could overcome the problems of earlier sensors. Four circular matrices were tested with pore size distributions (and equivalent water potentials) of 2 to 2.5 um (-145 to -116 kPa), 4 to 5.5 um (-72 to -52 kPa), 4 to 10 um, (-72 to -29 kPa) and 10 to 16 um (-29 to -18 kPa). Each matrix was securely fastened to a spiral copper trace on a printed circuit board. Sintered glass probes were compared to readings with tensiometers and pressure plates. Relatively fast responses were observed from all sensors and output was reproducible for multiple sensor matrices. In addition, sensors showed similar response in several soil types and had a low susceptibility to temperature fluctuations. The results suggest a moderate range of in situ water potentials can be measured using the appropriate matrix size of sintered glass matrix.

Corresponding Author Information:

Colin Campbell
Decagon Devices, Inc.
950 NE Nelson Ct.
Pullman, WA 99163

phone: 509 332 2756
fax: 509 332 5158
e-mail: colin@decagon.com

Presentation Information:

Presentation Date: Tuesday, November 12, 2002
Presentation Time: 4:00-6:00 pm
Poster Board Number: 1501

Keywords:

soil water potential, dielectric, water content