

ASA, CSSA, and SSSA 2010 International Annual Meetings

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Green Revolution 2.0: Food+Energy and Environmental Security

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301-7 Column Displacement Experiments to Evaluate Electrical Conductivity Effects On Electromagnetic Soil Water Sensing.

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See more from this Session: Innovation: Novel Measurement Methods: II

Wednesday, November 3, 2010
Long Beach Convention Center, Exhibit Hall BC, Lower Level

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Bulk electrical conductivity (EC) in superactive soils has been shown to strongly influence electromagnetic sensing of permittivity. However, these effects are dependent on soil water content and temperature as well as the pore water conductivity. We carried out isothermal column displacement experiments at soil water saturation to evaluate the influence of changes in bulk EC on soil permittivity measurements with time domain reflectometry (TDR) and a capacitance sensor (TE-5). Changes in permittivity inferred by TDR measurements could be properly accounted for using the phase velocity equation for transversal electromagnetic waves. In contrast, permittivities measured using capacitance sensors exhibited a negative response to bulk EC in a fine sand and a positive response in a clay loam.

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