Effect of Ionic Strength and Sodium Adsorption Ratio on the Flocculation/Dispersion of Two Surface Soils from Eastern Arkansas. (S02-alhammadi173637-Poster)

Authors:

- M.S.Y.AL Hammadi - *United Arab Emirates University*
- D.M.Miller - *University of Arkansas*

Abstract:

The tilth of many cultivated soils in eastern Arkansas is quite poor. Surface crusting is widespread and is often so severe that emergence of rice and soybean seedlings is reduced or, in exceptional cases, prevented altogether. Surface crusts reduce the rates of water and gas movement, reduce water infiltration rates, and increase water runoff rates. The cause of the poor tilth that is characteristic of these soils is not fully understood. The objective of this study was to quantify the effects of sodium adsorption ratio (SAR) and ionic strength (IS) on the flocculation/dispersion behavior of clay isolated from two cultivated surface soils from eastern Arkansas. Sharkey and Desha (taxonomic classification) clays were equilibrated with a series of solutions having five different IS and eleven different SAR. The research indicated that clay dispersibility was a more sensitive function of SAR at low IS than at high IS. Critical flocculation concentrations increased in a linear manner with SAR for both soils, but the slope of this line was much steeper for the clay isolated from the Sharkey soil. The Sharkey clay was generally more dispersive than the Desha clay, which may have been a result of differences in clay mineralogical composition.

Corresponding Author Information:

Mohamed Al Hammadi
University of Arkansas
1500 N. Leverett #135
Fayetteville, AR 72703
United Arab Emirates

phone: +9714-3445756
fax: +9714-3498974
e-mail: mohameduae@hotmail.com

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