

Wettability of Soil Aggregates from Cultivated and Non-Cultivated Ustolls and Usterts. (S06-schumacher100418-Poster)

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Abstract:

Soil organic matter can modify the interaction of clay minerals with water, limiting the rate of water intake of swelling clays and stabilizing soil aggregates. Soil structural stability and organic C content often decrease with cultivation. Rapid wetting increases stress on aggregates and decreases stability. Aggregate wettabilities of prairie soils under three different management systems (grassland, no-till, and conventional-till) were compared in central South Dakota. Six Ustolls and two Usterts were selected as replications along the Missouri River. Wettability was measured as water drop penetration time (WDPT) and as rate of water intake under 30 and 300-mm tension. At 30 mm tension aggregates from both cultivated fields and grasslands showed similar wettability. Grasslands with Ustoll soils had significantly greater wettability at 300 mm tension than did cultivated soils (no-till and till soils). Ustert soils did not have a difference in wettability based on management system. Ustert soils had significantly longer WDPT than did Ustoll soils. Differences in clay content and organic carbon contents were related to the differences of wettability between soil orders.

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