Using 3-D Visual Computer Software and Griding Algorithm to View Seasonal Soil Water Changes in a Hillslope. (S06-chen124930-Oral)

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Abstract:

Conservation tillage and residue cover can reduce surface runoff. In hillslope soils, subsurface flow occurs when soil hydraulic properties meet the conditions for the formation of such flow. The objective of this study was to investigate soil hydraulic conductivity and water distribution in a hillslope under no-till continuous cereals. Forty-five neutron probe access tubes were installed across the hillslope. Water content was measured once a month from September 1997 to July 2000. Field saturated hydraulic conductivity was measured at twenty-four locations across the slope using the double-ring method. Spatial variability and distribution of field saturated hydraulic conductivity and over-winter (September to March) water storage was displayed using variogram and kriging. Field saturated hydraulic conductivity had a log-normal distribution, and over-winter water storage had a near normal distribution. Over-winter water storage was not correlated to the elevation of measuring sites. Mean over-winter water storage efficiency (soil stored water/precipitation) was 0.6-0.7 during 1997, 1998, and 1999. Three dimensional visual displays of water content and potential can help to understand seasonal water changes and directions of water movement in hillslope soils.

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