## Saturated Hydraulic Conductivity versus Soil Permeability Classes: Facts, Fiction, and the Future. (S01-wysocki122403-Poster)

Authors:

- D.A.Wysocki\* NRCS-National Soil Survey Center
- P.J.Schoeneberger USDA-NRCS, Lincoln, NE
- B.Lowery University of Wisconsin
- R.Paetzold USDA-NRCS, Lincoln, NE

## Abstract:

Hydraulic conductivity of saturated soil (Ksat), the proportionality factor between the flux velocity and the hydraulic gradient, is an important soil water parameter. Need exists for both measured and estimated Ksat values. The NRCS Soil Permeability Classes are widely utilized as an estimated Ksat. Confusion persists on the relationship between Ksat and the Permeability Classes. Permeability Class units, expressed as length/time (e.g., cm/hr), are a percolation rate that equals the flux (q) in Darcy's equation. The original percolation rate measurements employed both a variable and constant driving head with the hydraulic gradient greater than unity. Percolation rates exceed and have a none-uniform relationship to Ksat, but with prudence may be used as an estimated Ksat. Permeability Class values mathematically are not a proportionality factor (Ksat) and should not be substituted for Ksat in Darcy's equation. Conversely, a calculated Ksat from a field or lab measurement does not yield the percolation rate of the Permeability Classes. To alleviate confusion and avoid scientific inaccuracies, we recommend the use of Soil Ksat Classes rather than Soil Permeability Classes.

**Corresponding Author Information:** 

Douglas Wysockiphone: 402 437 4155USDA-NRCSe-mail:Denney Fed Building 100DWysocki@nssc.nrcs.usda.govCentinnial Mall North, MS34Lincoln, NE 68508

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