Inhibiting water infiltration with PAM and surfactants: Applications for irrigated agriculture. (S06-lentz165213-Oral)

Authors:

• R.D.Lentz* - USDA-ARS-NWISRL, Kimberly, ID

Abstract:

Treatments that decrease infiltration into unlined canals, reservoirs, and at the inflow end of furrows may reduce seepage losses and improve application uniformity. We used soil columns with a constant head apparatus and miniflumes to evaluate infiltration-modifying treatments that initially applied water soluble anionic PAM (10 to 1000 mg/L), alone and combined with anionic surfactants, to Portneuf silt loam and other soils of varying texture and Na content. Effective conductivities (infiltration rates) for the high PAM treatments and treatments combining low PAM followed by a 0.1 M anionic surfactant, were significantly less than those of controls. Adding sediment and turbulence with the initial water applied produced treatment conductivities that were 1 to >2 orders of magnitude less than those for controls. Conductivity reductions increased with soil clay content. Efficacy of surfactant-only treatments declined with increasing soil Na content. In miniflumes, high PAM treatments significantly reduced infiltration in the inflowend half of furrows and increased it in the outflow-end, relative to controls. Further research is needed to evaluate these infiltration-inhibiting treatments under field-scale conditions.

Corresponding Author Information:

Rodrick Lentz USDA-ARS-NWISRL 3793 N 3600 E Kimberly, ID 83341-5076 phone: 208-423-6531 fax: 208-423-6555 e-mail: lentz@nwisrl.ars.usda.gov

Presentation Information:

Presentation Date: Monday, November 11, 2002 Presentation Time: 8:40 am

Keywords:

furrow infiltration, irrigation uniformity, polyacrylamide, seepage losses