

SIMULATING NITRATE AND POTASSIUM ION TRANSPORT FOLLOWING THE APPLICATION OF VINASSE TO LABORATORY SOIL COLUMNS

Jarbas Miranda, "Luiz de Queiroz College of Agriculture" - ESALQ/USP, +55 19 3429 4123 210,
jhmirand@esalq.usp.br

1. Jarbas Honorio de Miranda, "Luiz de Queiroz" College of Agriculture (LEB/ESALQ/USP)
2. Martinus Th. van Genuchten, COPPE/LTTC, Federal University of Rio de Janeiro, UFRJ
3. Richard A. Cooke, University of Illinois at Urbana-Champaign
4. João Alberto Lelis Neto, "Luiz de Queiroz" College of Agriculture (LEB/ESALQ/USP)

A combination of experimentation and computational modeling is important to understand and predict the long-term consequences of alternative management practices on soil and groundwater quality. Laboratory column transport experiments were carried out to better follow the movement of nitrate and potassium released from vinasse applied to the columns. The experiments were carried out using disturbed samples from two distinct soil profiles collected at 0-20 cm depths. The data were analyzed in terms of equilibrium and nonequilibrium solute transport formulations, leading to estimates of such transport parameters as the retardation factor, the dispersivity and several physical nonequilibrium parameters. Both nitrate and especially potassium were found to be subject to sorption by the solid phase. The estimated transport parameters were subsequently used to predict concentration profiles during transient infiltration in separate soil columns using the Hydrus-1D software package. Good agreement was obtained between measured and predicted distributions water content and concentration distributions in the columns.