



Bromide transport in different soils under no till and conventional tillage

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Prediction and description of water and solute movement within different soil tillage systems is essential when investigating pesticide contamination of soils and groundwater resources. Tillage systems can modify the chemical and biological properties of soil, and furthermore it can alter the pore system and structure. Conservation tillage can accelerate leaching of non reactive solutes and pesticides. Alternatively, solute transport is reduced in conventional tillage by diminishing functional macropores.

Our research focused on the study of bromide transport in undisturbed soil columns from three different soils of Argentina, from the provinces of Córdoba, Buenos Aires, and Paraná, managed under no till (NT) and conventional till (CT). Bromide was used as a tracer solute. Experimental data was fitted using the convection dispersion equation (CDE) with the program CXTFIT 2.0. The parameters pore water velocity (v) and hydrodynamic dispersion (D) were estimated.

Both NT and CT soils from the province of Paraná had the highest v compared to the other examined soils. Paraná soil has the highest clay content, which may influence its structure (increasing the amount of macropores) and possibly decreasing lateral mass exchange. Additionally, this soil had a higher v under NT practices than CT, while no significant difference between NT and CT were found in soils from Córdoba and Buenos Aires. Dispersion was relatively high in all soils, particularly for Paraná soil under NT. Dispersion was considerably much higher with NT compared to CT columns of the same soil.