

Research Article

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# Nitrate leaching in soil of different cropping systems of middle Gangetic plain of India

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## Summary

Solute transport down a soil plays a significant role in determining the potential contamination of ground water resources, particularly for the nitrate, heavy metals, arsenic and fluoride. The ability to predict the relative mobility of dissolved solute in the soil solution is of considerable value in managing land disposal of wastes and in fertilizer applications. Such predictive capability requires knowledge of physical, chemical and biological processes influencing solute behaviour in the soil environments. In this study, attempts have been made to explore nitrate transport through vertical soil column of several soils of different cropping systems viz., rice-wheat, rice-vegetable, vegetable-vegetable, pulse-pulse, orchards and sugarcane. Vertical soil leaching column studies were carried by spiking the nitrate solution ( $531.6 \text{ mg NO}_3^-$ ) on the top of the saturated soil columns followed by constant water head flow of water at definite time interval (1, 2, 3, 4, 5, 10 and 24 hours). It was observed that the nitrate retention on soils column was comparatively higher in the soils of orchard (82.1%) and rice-vegetable (approximately 70%) cropping system areas, whereas retention was noticed very low (>20%) in the soils of pulse-pulse cropping system areas. In addition, the breakthrough curve (BTC) of  $\text{NO}_3^-$  leaching through different soil columns were drawn with respect to relative concentration ( $C_0/C_1$ ) of  $\text{NO}_3^-$  leachate against the pore volume (Pv) of the soil columns in the period (1 to 24 hours) of leaching.

**Key words :** Nitrate transport, Soil column, Leaching, Breakthrough curve, Cropping system

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