# Leaching of nitrate nitrogen under different growing crops and nitrogen rates from Fluvisols of Southern Bulgaria

**Dimitranka Stoicheva, Venelina Koleva**
*N.Poushkarov Institute of Soil Science , Sofia 1080, Bulgaria*
*E -mail: dstoicheva@abv.bg*

Leaching of nitrates is primarily associated with conditions that allow nitrogen accumulation in the soil profile. The specific aim of this paper is to evaluate nitrate nitrogen and base cations leaching under Fluvisol rooting zone of cereals and vegetables, grown with application of different N rates and water supply. Data was obtained during field experiments: with cereals (wheat, barley, maize) and with vegetables (pepper, beans, carrots, aubergine) during 1999-2005.

The experimental design with cereals included two N fertilizer treatments and one control. The experiment with vegetables included three N treatments: optimal, 50 % below and 50 % above the optimal. Chemical elements leaching through the soil profile was monitored by modified Ebermayer lysimeters type cut into the soil at 100 cm from the soil surface.

An enhanced migration of $NO_3$-N and $Ca^{2+}$ in dependence with the applied fertilizer rates was observed in all grown crops, but the correspondence between the applied N rates and amounts leached was better in cereals. The highest N leaching was obtained under maize (8 – 33 kg.ha$^{-1}$) and in the experiment with vegetables N losses were the highest under pepper (9-17 kg.ha$^{-1}$).

A good correlation was found between the N rates and $Ca^{2+}$ losses under cereals, while this relationship was not so well expressed under vegetables. $NO_3$-N concentration in the lysimetric water under the maximum N treatments exceeded the MPCL for drinking water and could turn into a source of groundwater enrichment by nitrates.

**Keywords:** Fluvisols, N-fertilization, leaching, nitrates, groundwater protection