

Leaching of Mineral and Organic Nitrogen and Phosphorus in Relation to Long-Term Cropping and Fertilization Intensity

Martin Kuecke¹, Deok Hoon Yoon²

¹Federal Research Centre for Cultivated Plants; Julius Kuehn Institute,

²Institute of Crop and Soil Science College of Agriculture & Life Science, Hankyong National University, Republic of Korea
martin.kuecke@jki.bund.de

Between 2001 to 2004 the leaching of mineral and organic nitrogen and phosphorus was studied in different German field experiments in relation to soil types (sand, clay loam), soil cultivation (conventional tillage, minimum tillage), land-use (grassland, arable-land) and fertilization (organic and mineral fertilization). Passive capillary samplers were chosen to collect seepage water. The highest concentrations of mineral N (NO_3 and NH_4) were detected generally in the late winter, while mineral P concentrations were highest in late summer. Organic N and P concentration showed no seasonal trend. 22 % of the total nitrogen was found as organic N in the drainage from the clay loam, while it was only 7 % for the sand soil. The contribution of organic P in the total P content in the leachates was influenced by land use: On the sandy soil from 47 % (long-term mineral fertilization) and 15 % on permanent grassland; On the clay loam soil from 38 % in the minimum tillage plot to 15 % in the conventional tillage plot. A decrease of the nitrate concentrations in the drainage was usually accompanied by an increase of the PO_4 concentrations. In such situations, a higher contribution of macropore/preferential flow to leaching is assumed. The P/NO_3 ratio can be used as an indicator to explain the presence of macropore and/or preferential flow.

Keywords: nutrient leaching, macropore transport, nitrate, ammonium, phosphorus, organic nitrogen, organic phosphorus

Assessment of Spatial Distribution Patterns of Soil Properties in the EAARI-Experimental Station (Erzurum)

B. Turgut, T. Oztas, E.L. Aksakal

Eastern Anatolia Agricultural Research Institute Ataturk University
toztas@atauni.edu.tr

Defining spatial distribution patterns of soil properties within a field or watershed is important for site-specific soil and plant management. The objective of this study was to determine spatial distribution patterns of particle size distribution, organic matter, lime content, pH and plant-available P contents of soils in the Experimental Station of the Eastern Anatolia Agricultural Research Institution (EAARI). The research area, about 100 ha, was gridded with 100 m intervals in the north to south and east to west directions, and 68 soils samples were collected from 0-20 cm depth at each intersection. An isotropic-spherical semivariogram was fit to explain spatial variability of organic matter, lime content, pH and plant available P. Clay and sand content showed anisotropic variation, and silt content produced pure nugget effect. Block kriging analysis was performed to prepare distribution maps. Distribution patterns of soil properties studied showed a great amount of similarities with each other, as the patterns of yield.

Keywords: geostatistics, spatial variability, soil properties



INTERNATIONAL

MEETING ON SOIL FERTILITY

LAND MANAGEMENT AND AGROCLIMATOLOGY

29 October - 1 November 2008

Kusadasi TURKEY



ABSTRACT BOOK



TÜBİTAK