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# Monitoring the effects of manure policy in the Peat region, Netherlands

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Total N concentrations in farm ditches in the Peat region of the Netherlands are on the average twice as high as the Good Ecological Potential value of the Water Framework Directive. Since ditches are connected to regional surface water, they may contribute to eutrophication. The minerals policy aims to improve the water quality.

In the Netherlands, the effectiveness of the minerals policy on water quality is evaluated with data from the National Minerals Policy Monitoring Programme (LMM). This regards farm data on the quality of water leaching from the root zone and on farm practices. The soil balance nitrogen surpluses decreased between 1996 and 2003 on dairy farms in the Peat region. However, no effect on root zone leaching was found. This study aims to show how monitoring in the Peat region can be improved in order to link water quality to agricultural practice.

Contrary to the other Dutch regions, nitrate concentrations in root zone leaching on farms in the Peat region are often very low (90% of the farms below 25 mg/l) due to the reduction of nitrate (denitrification). The main nitrogen (N) components in the peat region waters are ammonium and organic N. Total N is therefore a better measure for N concentrations in the Peat region.

The ammonium concentration in groundwater in Dutch peat soils increases with depth. It is assumed that the deeper ammonia-rich water is older and relates to anaerobic peat decomposition instead of agricultural practice. Recent infiltrated low-ammonium water, lies like a thin freshwater lens on the older water. In the Peat region, root zone leaching is monitored by taking samples from the upper meter of groundwater. Unintended, often both lens water and older water are sampled and this distorts the relation between agricultural practice and water quality.

In the Peat region, the N surplus is transported with the precipitation surplus to ditches. The relation between the N surplus and the total N in ditch water is therefore better than between N surplus and total N in root zone leaching.

The precipitation surplus flows to ditches directly or via open field drains. However, the ditches may be fed partly with older water (seepage of groundwater). In the open field drain only recent water will occur. We expect that monitoring the water quality of the open field drains may even better reflect changes in agricultural practices. These data may also improve the understanding of contribution of agricultural nitrogen and natural nitrogen, necessary to develop measures to decrease the total-N concentration in ditch water.