



Estimating the water quality of agricultural drainage systems in connection with land use

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Land use and soil characteristics across 22 tile drainage source areas were correlated to measured nitrate concentrations between the years 2004 and 2006. The analyses of drainage water samples, taken with 14 days periodicity, were beside nitrates (NO_3^-) focused on nitrite (NO_2^-), ammonium (NH_4^+), pH, dissolved phosphorus (PO_4^{3-}), chemical oxygen consumption (permanganate value) and electrolytic conduction. Measured and evaluated were also water flow rate, water and air temperature. Drainage systems included in this study were located within the Czech crystalline complex.

Together with comprehensive statistical analyses of the data (flow rate and nitrate concentration) a multiple linear regression analysis was performed to assess which characteristic (% of drained agricultural soil, % of arable land, % of the infiltration most vulnerable soil) of sub-catchment related to the monitored drainage (so called source area) was having the strongest influence on nitrate pollution in drainage waters. As the autonomous variable the C90 value (90% probability of non-exceedance) of nitrate concentration in drainage waters was chosen, as dependent variables above mentioned drainage source area characteristics. Attained model ($P < 0.01$; $R^2 = 0.81$) found out that the strongest effect on nitrate concentrations in drainage waters had the ratio of arable land within a drainage source area.

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project No. QF 3301 “*Diagnostics, monitoring and revitalization of drainage sub-soil systems built on agricultural land in the view of water quality protection*” kindly financed by the Czech National Agency for Agricultural Research. One of this project intended objective was to design a proposal in terms of possible future involvement of the agriculture drainage systems phenomenon in the actual nitrate monitoring programme; bearing in mind there is approximately $\frac{1}{4}$ of agricultural land sub-drained in the Czech Republic.