

Contents of nitrate-nitrogen in soils with a six-year crop rotation

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Abstract

In ecological managed systems nitrogen often is the limiting factor for growth. That is why efforts for the effective use of nitrate-nitrogen within a crop rotation are main focus in many investigations. This problem is especially important on sandy soils with low humus in north-east Germany. The more sandy the soil the lower is the ability to accumulate water and nutrients. In consequence the danger of nutrients leaching is increasing, especially for nitrogen. On the one hand nitrogen is lost in the cycle of a farm, on the other hand it is followed by an increasing accumulation in the cycle of ground water.

In a six-year crop rotation in the location of Gülzow (Mecklenburg-Vorpommern) contents of nitrate-nitrogen in soils has been analyzed in a depth between 0 and 90 cm on a organic and conventional managed experimental field to compare the results. Samples were taken with an soil auger. Nitrate was analyzed by hydrazin reduction in an analysing automat (SKALAR). For statistical evaluation SAS (Statistical Analysis System) and for clearing of unorthogonal data procedure MIXED of PIEPHO and MICHEL (2001) were used.

Contents of nitrate-nitrogen in autumn and spring are lower for organic management than for conventional. Nitrogen losses during winter are subjected to heavy annual variations. High contents of nitrate-nitrogen in the end of vegetation resulted in high losses on sandy soils in winter. The amount of contents of nitrate-nitrogen in the end of vegetation is heavily influenced by the crop rotation and the management connected with this crop. Danger of high losses of nitrate-nitrogen during the winter is especially big in the growing of winter grain with legumes grown before. Losses through leaching can be decreased by catch crops and by high degree of soil covering for example with clover and grass.

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