Geophysical Research Abstracts,
Vol. 10, EGU2008-A-02053, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-02053
EGU General Assembly 2008

The function of shelterbelts of different age as biogeochemical barrier on decreasing of nitrogen and phosphorus in agricultural landscape

R. Jaskulska, **L. Szajdak,**

Research Center for Agricultural and Forest Environment, Polish Academy of Science, Bukowska 19, 60-809 Poznań, Poland (reniajas@tlen.pl / Fax: +48 61 8473668 / Phone: +48 61 8475601)

The investigations were carried out in the Chlapowski's Agroecological Park situated 40 km South-West of Poznań, Poland. This area is located on loamy soils, which contains 70% cultivated fields and 14% shelterbelts and small afforestations.

The function of two shelterbelts as biogeochemical barriers and adjoining cultivated fields was investigated. The shelterbelts represent different ages and the content of plants as well as humus quantity in surface layer.

The first one is 160-year-old shelterbelt, basic species is *Robinia pseudoacacia* L., *Quercus rober* L. and *Alnus glutinosa* (L.) Gaertn. and is characterized by a well-developed humus level. The other one is14-year-old shelterbelt includes 13 species of trees and revealed a small amount of organic matter.

Dissolved forms of nitrogen (N-NO_3^-), and phosphorus (P-PO_4^{-3}) in ground water under shelterbelt, and adjoining cultivated fields were investigated.

The concentrations of nitrates and phosphates in ground water under shelterbelts were smaller than in adjoining cultivated fields. The content of N-NO_3^- is 57% and P-PO_4^{-3} 71% smaller in ground water under the shelterbelt 160-year-old and also the highest concentrations of ammonium 29% than in ground water of adjoining cultivated fields. However, in 14-years old shelterbelt the amounts of chemical substances in ground water in system field-shelterbelt were similar.

The results revealed, that the 160-years old shelterbelt characterizing developed organic matter significantly limits the spread of chemical compounds in ground water and sufficiently fulfils the function such as biogeochemical barrier in agricultural landscape.

However they do not limit of the spread of N-NH_4^+.