

THE TRANSFORMATION OF NITROGEN IN SOILS UNDER SHELTERBELTS OF DIFFERENT AGE

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The investigations were carried out in soils under three different afforestations. Two afforestations were created 200 years ago. One of these includes *Robinia pseudacacia* with admixture of *Quercus petraea* and *Quercus robur* and the second one *Crataegus monogyna*. Third shelterbelt was planted ten years ago and includes several species of plants: *Quercus petraea* and *Quercus robur*, *Larix deciduas*, *Pinus silvestris*, *Sorbus aucuparia*, *Sorbus intermedia*, *Tilia cordata* and some other tree species.

These three shelterbelts are located on grey-brown podzolic soil. In soils were determined: total carbon, total dissolved carbon, total nitrogen, activity of urease and activity of nitrate reductase and indole-3-acetic acid.

The highest content of total nitrogen, total carbon and total dissolved organic carbon were measured in soils under two old shelterbelts. It indicates the highest accumulation of organic matter in soils under two old shelterbelts. Similar low concentrations of total organic carbon, dissolved organic carbon, total nitrogen were observed in soils under young shelterbelt and in adjoining cultivated fields to all shelterbelts. In soils under two old shelterbelts were also measured the highest activity of urease and nitrate reductase ranged from 26,7086 to 54,6612 [$\mu\text{mol of urea}\cdot\text{g}^{-1}\cdot\text{d.m.}\cdot\text{h}^{-1}$] and from 0,0666 to 0,3631 [$\mu\text{N}\cdot\text{g}^{-1}\cdot\text{d.m.}\cdot 24\text{h}^{-1}$], respectively. The highest activity of these two enzymes in soils under two old shelterbelts suggest the highest content of organic nitrogen compounds and also valuable conditions to denitrification. This suggestion is recommended for the highest content moisture in these two soils. This investigations revealed that the process of accumulation of organic nitrogen compounds in soils under two old shelterbelts is very stable. Contrary we can say for the soil under young shelterbelt and for soils of adjoining cultivation fields. In soils under old shelterbelt containing *Robinia pseudacacia* was measured higher content of indole-3-acetic acid than in soil under young shelterbelt and in adjoining cultivated fields. This substance is phytohormone in soils, which plays very important function in the process of seed sprouting and plant development. These investigation shown the impact of old shelterbelts on the accumulation of organic matter, different form of carbon, activity of enzymes and phytohormone in soil.