Geophysical Research Abstracts
Vol. 13, EGU2011-7803, 2011
EGU General Assembly 2011

Carbon stock of the soil in some West-Hungarian forested lands

András Bidló (1), Péter Juhász (1), Péter Szűcs (1), and Péter Ódor (2)

(1) Department of Forest Site Diagnosis and Classifikation, University of West-Hungary, Sopron, Hungary (abidlo@emk.nyme.hu), (2) Department of Plant Taxonomy and Ecology, Loránd Eötvös University, Budapest, Hungary

The region „Őrség" is situated in the western corner of Hungary, close to the border of Austria and Slovenia. This region is consisted of gradually flattening hills with a high above sea-level 150-350 m. The temperature is about 9,5 °C, while the annual precipitation is 738 mm in average per annum and the soil cover is pseudogley brown forest type as the consequence of the parent rock and the geographic conditions. The present status of the sites are highly influenced by the small landowner peasant practical means (selection and litter-removal).
Our investigations were carried out in 35 broadleaved-conifer mixture stands. These experimental stands were chosen in such departments, which have not been disturbed in the recent decades and were in middle age.
In each sample plot there were 5 repetitions and litter samles collected with the help of a framework of 30 x 30 cm. Soil samples were also taken from the soil layers 0-5, 5-10, 10-20 and 20-30 cm depth according to the IPPC prescriptions (2003, 2006). Litter samples were then separated (leaf, needle, branch, decomposed components) and the dry material of all components determined on one point in the sample plot. pH-level (pH H2O) and the carbon and N-contents measured together with the mechanical composition. For the investigations volume sampler cylinders of Vér-type were used for each soil layer.
The quantity and composition of litter cover are basically determined by the tree species composition and structure of the forest stand. Mean volume of litter cover is 2,3 t/ha in leaves, 0,9 t/ha in needles and 1,8 t/ha in branches, while that in decomposed material amounted to 10,6 t/ha. Total dry material of litter cover was 15,5 t/ha and the pH level of the carbon content in the litter was about 5,3. Taking the organic matter content in the litter into consideration relatively low values were found with an average of 40 C%. With regard to the specific values the carbon content in the litter has not been more than 5 t/ha.
Investigating the organic carbon content in every single soil layer it has been established that the soil (0-30 cm) is capable for the reservation of 46 t/ha carbon. The least values have been found in the litter cover (3 t/ha), while the highest in the soil layer of 0-5 cm depth, amounting to 36 t C/ha. In comparison with the surface soil cover the carbon-content reserved in the litter has been amounted to nearby 10% of that of the carbon capacity of the upper soil layers in average.

These investigations have been done with the sponsorships of OTKA, TÁMOP 4.2.2. and TÁMOP 4.2.1