ACCUMULATION OF ORGANIC CARBON IN HEAVY LOAMY SODDY-PODZOLIC SOIL

L. V. Boitsova, S. V Neprimerova, E. G. Zinchuk

Agrophysical Research Institute,
14, Grazhdansky pr., St. Petersburg, 195220;
E-mail: larisa30.05@mail.ru

The paper describes the results of a study of carbon accumulation in soddy-podzolic heavy loamy soil (Umbric Albeluvisoil) of various land use in the Novgorod region. The types of land use were: arable land, fallow land, forest. Three horizons from the soil profiles were studied: A1 (P); A2B (BEL); BC (BtC). Organic carbon was measured in the following texture fractions: 0.25–0.05 mm (fine sand), 0.05–0.01 mm (coarse silt), 0.01–0.005 mm (medium silt), 0.005–0.001 mm (fine silt) and less than 0.001 mm (clay). A qualitative and semi-quantitative analysis of the soil minerals of the various texture fractions was carried out. The total organic carbon (C_{org}) content in the upper horizons of the soils was decreasing in the series from the fallow to the forest and to the arable land; in the underlying horizons, the order has changed somewhat and Corg content was decreasing from the forest to the arable land and to the fallow. According to the total content of carbon deposited in the fine silt and clay fractions per soil mass, the soil upper horizons of the studied land use types could be put in the following decreasing series: fallow > forest > arable land. The concentration of carbon in the soil texture fractions was decreasing with increasing soil depth. In the soil of the upper horizon of the arable land and fallow, the coarse silt fraction gave the highest percentage of carbon sequestration (24–29% C of C_{org}), while the coarse sandy fraction accounted for 9–17% C of C_{org}. In the soil of the upper horizon of the forest, the clay fraction showed the highest percentage of carbon fixation (22% C of Corg), while the fine silt fraction bound only 12.5% C of C_{org}.

Keywords: texture fractions, organic carbon, land use.