



Corg migration pool in the black soils under different land use at the Volga upland

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Introduction. There are results of long-term (2006-2017) stationary field research on the land-use impact on the carbon fluxes in the black soils in the representative agricultural and native forest-steppe landscapes at the Volga upland (in case of the RTSAU educational-experimental farm "Mummovskoe", Saratov region, RF).

Objects and Methods. The principal set of the investigated objects include Leached Chernozems and Ordinary Chernozems at the fluvial terraces of the Bolshoy Kolyshley river (flowing in Medveditsa, the influx of Volga), Solonetzic Chernozems at its placores with alkalized clay loam parent materials and Meadow Chernozems in its floodplain – arable land, hayfields, meadows, primary and secondary forests. In the analysis of Corg soil pools especial attention has been dedicated to the water-soluble organic substances (WSOS) which are better mobile and available for microorganisms which utilize them, enhancing CO₂ emission.

Results and Discussion. Dominated in the Volga upland natural meadow steppe and forest landscapes are favorable for rich pools of Corg in these Chernozems (up to 300 t ha⁻¹) and atmospheric CO₂ sequestration. Most arable Chernozems are actively degraded there due to both topsoil CO₂ non-compensated emission and water-soluble organic substances vertical and lateral fluxes – firstly in form of free humic and fulvic acids, sodium and calcium humates and fulvates, as evidenced by sorption lysimetry data on the WSOS fluxes up to 29,2±2,5 g m⁻² over the vegetation period (April – October). Global climate changes result in its precipitation essential increasing in 25-30 % that stimulate as CO₂ emission as WSOS vertical and lateral migration with the subsequent degradation of soil humus, physic-chemical features, aggregate and hydrophysical state.