

ASSESSMENT OF ANTHROPOGENIC IMPACT ON THE STRUCTURE OF SOIL COVER OF UPPER VOLGA REGION AGROECOSYSTEMS

S. I. Zinchenko, I. M. Schukin

*Federal State Budget Scientific Institution «Upper Volga Federal Agrarian Research Center»
3, Tsentralnaya St., Novyi settlement, Suzdal district, Vladimir region, 601261
E-mail: zinchenkosergei@mail.ru*

In agroecosystems based on gray forest and sod-podzolic soils, the content of agronomically valuable aggregates and the structural coefficient depended on the intensity of anthropogenic impact. Intensive mechanical loosening of the soil using plowing led to the destruction of agronomically valuable aggregates: the structural coefficient of gray forest and sod-podzolic soils in a layer of 0–30 cm decreased by 10–20% and 45%, respectively, compared to the soil subjected to subsurface tillage. The structural coefficient of gray forest medium loamy soil increased with increasing anthropogenic impact due to the application of organic and mineral fertilizers to the soil. Soils subjected to subsurface tillage to a depth of 20–22 cm were characterized by high values of the structural coefficient: 3.9 in the layer of 0–20 cm, 4.9 in the layer of 0–30 cm, which exceeded the values of this indicator on the layland site (2.4 and 2.1 in layers of 0–20 cm and 0–30 cm, respectively). In sod-podzolic sandy loam soil with an extensive management system, the content of agronomically valuable aggregates in layers of 0–20 cm and 0–30 cm decreased by 14.7 and 17.0%, respectively (Least Significant Difference₀₅ = 9.5 and 5.6%), and the structural coefficient also decreased to the level of good aggregate state compared to the soil of a nearby forest site. An increase in the level of anthropogenic impact from normal to intensive organomineral (due to the application of mineral and organic fertilizers) led to an increase in the structural coefficient to the level of an excellent aggregate state – 1.7–2.1. An increase in the level of anthropogenic impact to high-intensity organomineral due to an increase in the rates of organic and mineral fertilizers allowed maintaining the structural coefficient and the number of agronomically valuable aggregates in sod-podzolic sandy loam and light loamy soils at the level of natural biocenoses.

Keywords: soil structure, Upper Volga region, sod-podzolic soil, gray forest soil, soil tillage, mineral fertilizers, organic fertilizers.

