

INFLUENCE OF VARIOUS **soil** TILLAGE SYSTEMS ON SOIL AGROPHYSICAL PROPERTIES AND YIELDS IN CROP ROTATION

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Different soil tillage systems of the sod-podzolic light loamy soils, typical for the most farms of Ivanovo region, were studied in a field experiment. The experiment was carried out in a stationary field crop rotation with the following alternation of crops: bare fallow – winter wheat – oats + clover – clover – winter rye – potato – barley. Four tillage treatments were compared: moldboard plowing (commonly used practice), flat plowing (resource-saving), combined (moldboard plowing, flat plowing) and shallow plowing. It was found that the soils in the fields under bare fallow and potatoes were characterized by the lowest values of the soil bulk density while the soils under winter crops and clover had the higher bulk density. The highest soil bulk density was observed at the shallow plowing. The similar results were received when the soil penetration resistance was studied. The flat and shallow plowing had a positive effect on the conservation of moisture in the soil. The reserves of productive moisture at the flat and shallow plowing, on average for the crop rotation, were, respectively, 1.8 and 1.4 mm higher compared to the moldboard plowing. At the moldboard plowing the soils were characterized by the best indicators of the structural-aggregate composition (the content of agronomically valuable water-stable aggregates and the structural coefficient). Indicators of biological activity of the soil were higher at the moldboard and flat plowing. The flat and combined plowing promoted an increase in the crop yields by 0.09 and 0.04 t ha⁻¹, respectively, while shallow plowing led to a decrease in the crop yields by 0.47 t ha⁻¹.

Key words: soil treatment, resource-saving, agrophysics, yield.