

INFLUENCE OF MINIMIZATION OF MAIN TREATMENT AND ORGANIC-MINERAL SYSTEM OF FERTILIZERS ON AGROPHYSICAL PROPERTIES OF BLACK EARTH SOIL

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The paper presents the results of the structure state and bulk density assessment of leached loam π clay chernozem with minimum tillage with various tools on the mineral and organo-mineral backgrounds of fertilization. Agrophysical properties are considered to be main indicators of soil fertility, therefore, their change inevitably affects the productivity of arable lands. It was established that the tier system of tillage contributed to an increase in the soil structure coefficient, optimization of the soil bulk density and increase in agricultural crop yields. The studies were conducted in 2011–2016 in the framework of field experiments in the Buinsky region of the Republic of Tatarstan. It was shown that the periodic downward movement of the upper part of the arable layer and the deep loosening of leached chernozem contributed to the improvement of the soil water-physical properties: the supply of productive moisture in the meter layer increased to 20%, the bulk density of the soil in the 0–40 cm layer decreased by 0,06–0,08–g–cm⁻³. Organo-mineral fertilizer system had a positive effect on the soil structure – with the longline and chisel tillage systems the aggregates had higher water resistance and were subjected to the destructive action of water to a lesser extent. The increase in water resistance was due to an increase in the content of agronomically valuable aggregates and a decrease in the number of fractions <0.25 cm in size, as well as due to higher humus content in the background. It is recommended to include periodic bunk plowing or deep chisel treatment once per crop rotation followed by shallow cultivation in the combined resource-saving soil treatment system.

Key words: mineral and organo-mineral fertilizer system, resource-saving primary tillage, minimization, agrophysical properties of the soil, yield, profitability.