

# THE INTERACTION OF SOIL «OPTIMUM DENSITY» WITH GRAIN PRODUCTIVITY

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The experiments have been carried out on dark gray forest heavy loamy soil. The results of the experiments have been verified on sod-podzolic light loamy soil on spring wheat crop. It was found that the yield of spring wheat significantly depended on the soil bulk density during the vegetation period «tillering – reaching the tube». In other phases of plant development, the effect of bulk density on the grain productivity was insignificant. The definition of the «optimal density» should be related not to soil tillage but to a soil and cultivated crop types. The possibility of forming the «optimal density» with a combination of soil-cultivating tools or technologies, should be checked in soil layers deeper than 10 cm. The value of the «optimal density» does not depend on the type of tools or technologies used to create it. The value of the «optimal density» of dark-gray forest heavy loam soil for a layer of 10–20 cm is 1.325 g cm<sup>-3</sup>, for a layer of 20–30 cm it is 1.365 g cm<sup>-3</sup>. The value of the «optimal density» should be connected with a specific layer of soil. The use of the definition of the «optimal density» to combined layers leads to a distortion of the results. The possibility of obtaining the maximum crop yield when applying a specific rate of mineral fertilizers depends on how close the soil bulk density to the optimal value.

**Key words:** soil bulk density, productivity, development phases of cereal crops, correlation index, the dose of mineral fertilizers.