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SOIL STRUCTURE AND AGGREGATE STATE OF LIGHT-GRAY FOREST SURFACE GLEYED SOIL UNDER THE PROLONGED AGROGENIC EFFECTS IN THE WESTERN FOREST-STEPPE

According to the results of researches it was established that macro- (>10 mm) and microaggregates (<0.25 mm) predominated in the structural-aggregate composition of the researched soil regardless of fertilizer systems and use. The number of mesoaggregates (0,25–10 mm) is higher in the arable horizon compared to the subarable horizon, however, an exception is an option of organo-mineral fertilizer against the background of application 1,0 n of lime.

On the control without fertilizers in the HEgl_{arable} horizon of light-gray forest surface gleyed soil, among the mesoaggregates (0,25 to 10 mm in size) prevails 10–7 mm, 5–3 mm and 2–1 mm particles. Therefore the structure of the arable horizon is finely lumpy.

Because of the high content of macroaggregates and microaggregates in the horizon HEgl_{subarable} structural coefficient is low and is only 0,44. Structure in it is large lumpy. According to the water resistance coefficient by V. V. Medvedev, the humus horizons on the variant without fertilization are not highly water resistant (from 1,69 to 0,83).

The results of dry sieving of the soil indicate that the application of N₃₀P₃₄K₃₄ + 15 t/ha of manure + CaCO₃ (1,5 Ha) leads to a decrease in microaggregates content, increases in the structural coefficient and water resistance coefficient in the HEgl_{arable} and HEgl_{subarable} horizons in comparison with application of N₆₅P₆₈K₆₈ + 10 t/ha manure + CaCO₃ (1,0 Ha).

The sum of agronomic-valuable aggregates in the variant with long-term application of N₆₅P₆₈K₆₈ only along with structural coefficient 1,08–0,82 is 51,7 % in the arable horizon and 46,2 % in the underlying horizon, which characterizes their structure as finely-lumpy and dust-lumpy compared to non-fertilized control. According to a qualitative assessment of the water resistance of the macrostructure during application of N₆₅P₆₈K₆₈ only, arable and subarable horizons are characterized by excellent and good structural conditions.

The conducted studies highlighted the structural and aggregate state of acidic light-gray forest surface gleyed soil of long-term field experiment in conditions of periodically washing soil moisture regime. At the same time, the obtained results indicate that it is advisable to add a higher 1,5 n dose of lime according to hydrolytic acidity to form a larger sum of agronomically valuable aggregates in the arable and subarable horizons, a high structural and water resistance coefficients.