CZU: 631.41

ELEMENTS OF AGROGENIC EVOLUTION OF THE AGGREGATIC STRUCTURE OF CLAYEY-LOAMY AND LOAMY-CLAYEY MODERATE HUMIFERUS CHERNOZEMS

Stadnic Anjela
Moldova State University, Chisinau, Republic of Moldova
E-mail: anjela.stadnic@mail.ru

The aggregate structure of soils is a distinct feature by which they differ from other bioroutinar systems and materialize in their eco/agroecosystemic functions. Through this prism of ideas, chernozems differ from other types of soils by the "chernozemic structure" represented by aggregates with dimensions mainly between 5-1 mm, porous and with increased water stability. Its formation and dynamics in conditions of natural ecosystems is the product of the interdependent and interdetermined interaction of coagulation, coprolitic and root mechanisms of aggregation-structuring that ensure the reproduction-renewal of the "chernozem structure" during the vegetation period thus ensuring the adaptation of ecosystems to the dynamics of environmental conditions.

Therefore, during the vegetation period, the content of valuable agronomic aggregates (0.25-10 mm) and agronomically precious ones (5-1 mm) are maintained in the optimal value ranges, respectively 70-80% and 50-60%. The content of aggregates> 10 mm during the vegetation varies insignificantly, and that of the aggregates <0.25 mm does not exceed 4%.

In such a dynamic, chernozems have a great ability to adapt to environmental conditions, including climate change, especially to drought.

In agroecosystem conditions, the intensity of the reproduction-renewal mechanisms of the "chernozem structure" is significantly reduced and the decisive role in the dynamics of structural composition belongs to the thermo-compression mechanism determined by the alternation of the hydrothermal regime of arable chernozems.

In the agrogenic layer, the "agrogenic structuring" leads to the increase of the aggregates content >10 mm and of the 5-10 mm ones. Their content increases during the growing season with maximum values at the end of it. The content of 5-1 mm aggregates during the vegetation period is reduced from 50-53% to 43-40% in the arable layer and below 35% in the subarable layer.

In the transition horizon (B) the structuring process is mainly determined by the thermo-compressive mechanism and leads to the formation of aggregates >7 mm, their content at the end of the vegetation period has values higher than 60%.

Significantly reduces soil aggregate stability. In the arable layer (0-20-25 cm) the aggregates >3 mm have no water stability. Aggregates 2-1 and 1-0.5 mm are characterized by maximum water stability. The aggregate content <0.25 mm is greater than 50%.

In the subarable layer, the water stability of the 5-3 mm aggregates slightly increases due to their partial compaction and the reduction of the mesopore volume. At the same time, however, it is due to the compaction of 5-3 mm aggregates and the reduction of the volume of aggregate pores. At the same time in the subarable layer aggregates with dimensions >10 mm with morphological and physical features not characteristic of chernozems are formed. The subarable layer is characterized by rigid placement of structural aggregates in the subarable layer in the wet period of the year creates anaerobic

conditions with negative impact on the soil biota, at the same time due to the reduction of the volume of interaggregate pores is the formation of an anisotropic profile of the porous space. This leads to a reduction in hydraulic conductivity on the soil profile and involves the seasonal over-wetting of arable chernozems during the wet period of the year.

Under conditions of low water stability of the structure, the degree of physical protection of organic carbon is reduced and as a result increase CO_2 emissions from soils. It also increases vulnerability to drought.

More recent research has shown that in order to ensure the stability of the structural-aggregate state during the vegetation period, measures are necessary to intensify the activity of the soil biota. Their number includes the treatment of soils with algal preparations based on nitrogen-fixing cyanophyte algae.

Their application to the soil in the early phases of the vegetation period contributes to the intensification of the coagulation, -radicular and coprolitic aggregation-structuring mechanisms of the soil mass with the formation of 7-1 mm aggregates and the increase of the content of water stable aggregates with a diameter of 7-1 mm. The monitoring of the structural aggregate condition during the vegetation period showed that the nitrogen-fixing cyanophyte algoflora contributes to the modeling of the soil biopedoplasm with the formation of a favorable environment for the functioning of the soil biome.

The maximum effects were found in the *Nostoc gelatinosum* variant (3 l / ha) in sunflower and corn crops.

Acknowledgments: The research was carried out within the Technology Transfer Project 21.80015.58.07.253T

Keywords: agronomic aggregates, chernozems, cyanophyte algae, hydrothermal regime, structure of soils.