

SOILS FOR FUTURE UNDER GLOBAL CHALLENGES

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STRUCTURAL STABILITY OF AGGREGATES OF VERTISOL DEPENDING ON THE CONTENT OF ORGANIC MATTER, CLAY AND CALCIUM CARBONATE



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INTRODUCTION

Soil structure affects the physical, chemical and biological processes of the soil. It affects the accessibility of air, water and nutrients, as well as resistance to erosion, germination rate and penetration of root systems into the soil. A total of 6 pedological profiles were opened at the sites on the territory of the city of Smederevo, three of which belong to the subtype Carbonate Vertisol, and three to the subtype Non-carbonate Vertisol. The purpose of the study was to determine the influence of clay, humus and CaCO3 on the structural stability of aggregates.

RESULTS AND DISCUSSION

The results of wet sieving of the soil show that the agronomically most important aggregates of 8000-2000 µm are the highest in the surface horizon, while with the increase of depth their share decreases. The fraction 2000-250 µm has the largest share in the AC horizon, while the fractions 250-53 µm and <53 µm have the highest values in the C horizon. In the case of aggregates 8000-2000 µm, differences were found in the A horizons of the Carbonate Vertisol (average 35.30), in the case of non-carbonate (average 13.44), while there were no differences with the depth of the profile. The fraction 2000-250 µm differs in AC horizons and amounts for carbonate (average 65.76%) while in Non-carbonate Vertisol (average 70.08%). No differences were found in the fractions 250-53 µm and <53 µm. The Mean weight diameter MWD results indicate that the structural stability of aggregates is higher in the surface horizon in Carbonate Vertisol (2.31), compared to Non-carbonate Vertisol (1.28), while with increased depth there were no differences. The MWD were mostly influenced by the content of CaCO₃, which was proven by a very strong correlation r = 0.82 between the content of CaCO₃ and MWD, while the content of clay and humus did not show a correlation with the MWD index.





MATERIAL AND METHOD

Samples were taken from genetic horizons A, AC, and C from three depths in the semi-disturbed state for analysis of structural stability of aggregates (wet sieving). Soil samples were used to determine clay, humus and $CaCO_3$



CONCLUSION

fraction

<53 µm

Although low, concentrations of CaCO₃ in Carbonate Vertisol

significantly affected the MWD index, which was proved not only by the correlation but also by the difference of MWD in the A horizon of

Vertisol in favor of Carbonate Vertisol.

fraction

2000-250 µm