

THE PARTICULARITIES OF THE EVOLUTION AND SUSTAINABLE MANAGEMENT OF SOILS IN NURSERY PLANTATIONS

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The specific features of watermelon plantations imply a trend of anthropogenic transformation and substitution of natural mechanisms with technogenic impacts at all levels of functioning of the soil ecosystem. Soil management in them involves complex measures of synergistic sustainability of physical, chemical and biological parameters within agrobiotechnologies based on the intensification of typogenetic processes by increasing bioenergetic resources and reducing technogenic inputs. Through this prism of ideas in the period 2024-2025 in our research, a model of complex agrobiotechnology was substantiated and tested based on and sustainability of bio-physico-chemical, physico-chemical and coprolitic mechanisms of soil aggregation and structuring by incorporating at a depth of 22-27 cm once a year the bioorganomineral preparation “NEOFERT-S” of humic origin (2t/ha) and plant residues at a depth of 14-16 cm. Monitoring the structural-aggregate state of the soils highlighted the increase in the content of 2-1 mm aggregates, which indicates the regeneration of aggregation processes, and the increase in the degree of hydrostability of 2-1 mm aggregates indicates an increase in the content of coprolites in their composition.

Management of biological parameters included the combined use of the bioorganomineral preparation of humic origin “NEOFERT-M” and the algal preparation *Chlorella vulgaris*, which resulted in an increase in the biological activity of soil microflora, manifested in an increase in the reserves of microbial biomass and enzymatic activity. The latter resulted in an increase in the activity of polyphenoloxidase and peroxidase. The ratio between them (Muromtzev coefficient) varies in the range of 0.8-0.97 and indicates the intensive implementation of the humification process, and the integrative index of the evolution of biological parameters is the fractional composition of humus manifested in the values $C_{ah}:C_{af}$ predominantly > 1 . Their dynamics during the vegetation period clearly indicates two consecutive stages in the implementation of the humification process: a) formation of humic substances and b) polymerization-condensation. The interconnected evolution of physical and biological parameters led to the increase in the content of nutrient elements in the soil and the balancing of the ratio between them.

Keywords: *organic organic mineral preparations, algae preparation, humus.*