

**THE HEALTH OF ARABLE CHERNOZEM SOILS THROUGH
THE PRISM OF THE "*BIOGEOCENOTIC FUNCTIONS OF THE
SOIL*" CONCEPT**

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Through the prism of the concept "biogeocenotic soil functions", soil health is a pedofunctional category, a complex product of the interdependent and interdetermined interaction of the basic functions (physical, chemical, physico-chemical, informational, integrative) and materializes in the production, environmental-formative and reproductive functions of the soil ecosystem. In this context, soil health involves two basic categories: a) the ecological capacity of the terrestrial ecosystem; b) the ecological stability of the soil ecosystem.

The ecological capacity of the terrestrial ecosystem is a quantitative expression of soil fertility (the productive component of terrestrial ecosystems) and characterizes its ability to ensure the functionality of a certain amount of "aboriginal" pedobionts, the population density of which is determined by the ecological resources of a particular biotope.

In this context, if the biotope is ecologically unstable (it is affected by various forms of degradation) the ecological capacity of the terrestrial ecosystem cannot be fully realized.

The ecological stability of the soil - its ability to resist degradation, i.e. to ensure the production function and to resist the negative impact of biotic and/or abiotic stress factors. This feature is ensured by the local ecological resources, the degree of balance of the structure and mass of pedocoenosis biota and biotope characteristics and materializes in the capacity of self-support, self-organization, self-regulation and self-purification of abiotic and biotic stress agents of the pedobiocenosis.

Soil stability is achieved in quantitative and qualitative soil health manifested in the ability to function for an indefinite period of time as a component of the terrestrial ecosystem and to ensure its bioproductivity, to support the quality of water and air, as well as the health of plants, animals and people.

Non-degraded (healthy) soils are characterized by inter-determined and interacting balanced parameters of biological diversity, efficient self-purification and suppressiveness in relations with phytopathogenic biota. The biotic functions of "healthy soil" are achieved through self-purification processes (biotransformation and/or decomposition with the participation of organotrophic destructuring microorganisms) and the suppression (elimination) of phytopathogenic microbiota that permanently infect the soil.

The suppressiveness of the soil is an indicator parameter of its health manifested in the suppression and or elimination of certain phytopathogenic species and is determined by the combined action of all species of microorganisms responsible for the biological, biochemical, physico-chemical, biophysical processes that take place in the soil and materialize in physical, physico-chemical, chemical, agrochemical, biophysical parameters (structural-aggregate state) of soils.

Through this prism of ideas, the health of the soil is the product of its evolution processes in the previous phases of pedogenesis, which involves 3 levels (abiotic, of non-individual integration of the soil, of individual integration characteristic only of the soil). Contemporary pedogenetic processes are responsible for the environmental modeling of the biotope for future generations of the biotic component of the soil.