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Effect of mineral fertilizers on microbiological and biochemical characteristics of agrochernozem.

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The problem of reproduction of soil fertility of chernozems are solved with integrated action, the ecological condition of the soil can be assessed by the activity of physiological groups of microorganisms.
Microorganisms are the most important in the transformation of compounds of biogenic elements and therefore it is very interesting to study the nature of the relationship of some biochemical parameters with the development of microflora and micromycetes eco-trophic groups.
Agrochemical researches have been conducted at agroecological station "Stone Steppe" in central Russia. Experiment variants: 1 – Control (without fertilizer); 2 – N10,5 P10,5 K10,5; 3 – N56,5 P56,5 K56,5; 4 – deposit soil.
Mobile forms of humic substances (mobile carbon and carbon water extract) have changed during the cultivation of the chernozem soil.
Amount of mobile humus has doubled in the variants with the use of mineral fertilizers. It's just mobile humus which determines the soil response to any impact, especially ecological.
Water extract carbon - organic matter contained in the soil solution and the subject of assimilation of plants and microorganisms. It increased in agricultural soils.
The total nitrogen and nitrate nitrogen amount in the variants of agricultural use is higher than in the deposit soil. This is probably because of the soil aeration, the release of nitrogen from the labile humus due to biological activity and nitrification. Amount of ammonia nitrogen has increased in the variant with the use of high doses of fertilizers.
Deposit soil (40 years without agricultural use) has a lower, but more stable microbial activity. Process of anoxic decomposition of plant remains develops more active than others, due to the natural structure of the soil anaerobiosis in the spring time. Processes of nitrogen cycle (nitrogen accumulation - fixation of atmospheric nitrogen, nitrogen losses - denitrification) are progressing very intensively in agricultural soil with fertilizer.
Content of humic substances in the soil affects all groups of microorganisms, except actinomycetes and cellulolytices. These microorganisms have an active system of hydrolytic enzymes that taking action on hard organic materials.
Movable carbon largely affects the anaerobic microorganisms nitrogen cycle and inverse relationship takes place during with the developing of actinomycetes.
Correlation between the aqueous extract carbon with cellulolitic bacteria, aerobic nitrogen-fixing bacteria and amylolytic microorganisms using mineral nitrogen is the highest.
Organic material of the soil solution in the growing season associated with NO_3-. The content of total nitrogen and nitrate associated with anaerobic denitrifying bacteria, nitrogen-fixing bacteria and amylolytic microorganisms.
The content of ammonia nitrogen N-NH4+ renders very strong influence on soil microorganisms. A positive correlation is observed with ammonifiers, nitrogen-fixing bacteria, denitrifying bacteria. There is inverse relationship with actinomycetes (R = - 0,96) and anaerobic cellulolitic bacteria (R = - 0,80).
Representatives of these microorganisms are active participants in the carbon cycle; their development in the presence of the ammonium form of nitrogen is possibly suspended.
There is a complicated relationship of biochemical indicators of the development of soil microorganisms in the black earth. The problem preserving stable humus and physiologically active mobile forms that affect plant growth can only be achieved while maintaining the living organisms in it.