

**THE INFLUENCE OF FARMING SYSTEMS ON THE SOIL
FERTILITY OF AGROPHYTOCENOSES SUGAR BEET**

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Was analyzed the influence of farming systems on the main indicators of soil fertility and yield during the cultivation of sugar beet. The application of ecological and biological farming systems has a positive effect on microbial activity, thereby increasing soil fertility.

Fertility, humus, sugar beets, microbiological activity.

Introduction. In the conditions the intensification of agriculture technology significantly increases the load on the ground. It changes the intensity and direction of biological processes that influence the dynamics of fertility. Tillage is a powerful anthropogenic factor. By changing the whole set of conditions, it creates a new environment for soil organisms. As a result of enhanced mineralization of organic matter undergoes substantial loss of humus – an important indicator of soil fertility. In connection with this a significant relevance to the issues the introduction of advanced technological measures, optimization of soil tillage in crop rotation in order to produce sustainable high yields of crops for a balance of humus in the soil [3].

V.R.Vilyams in the early twentieth century emphasized that active microorganisms occurs by plowing than tilting the soil without or before ploughing[1].

However, according to the S.P. Tanchyk and V. Y. Yamkovi [2] intensity schedule linen in the treated soil layer after tilting the soil without or before ploughing and its cultivation was virtually identical.

However, under ploskoriznoho and surface tillage intensity observed increased biological activity in the 0-10 cm layer, which decreases in the layer of 10-20 and 20-30 cm, which is a disadvantage of cultivation.

These various studies on the influence of the depth of cultivation and farming systems on soil microbiological parameters are contradictory and require research, which was the purpose of research.

The aim - to establish the impact of agriculture on the indicators of soil fertility and crop yields.

Materials and methods. Experimental studies were carried out in a stationary experiment NULES of Ukraine "Agronomic Research Station (p. Pshenychne, Kyiv region) and in the scientific laboratories of the Department of Agriculture and herbology for 2011-2013.

The scheme of crop rotation in field-cultivated grain rotation corresponds to zonal forest-steppe conditions: alfalfa, winter wheat, sugar beet, corn for silage, winter wheat-maize-pea-winter wheat-sugar beet-barley sowing of alfalfa.

Graduation of the first factor - the farming system, composed on the basis of their resource provision for restoring soil fertility:

industrial (control) – the preferred use of agrochemicals industry for restoring soil fertility with the introduction of per hectare crop rotation area 12 tons of manure , 300 kg NPK fertilizers, intensive protection of crops from pests;

Environmental - priority use for restoring soil fertility of organic fertilizers with the introduction of crop rotation area per hectare to 24 tons of organic (manure 12 tons, 6 tons of non-tradables parts yield, 6 tons of green manure nutrient weight) and 150 kg NPK fertilizers , the use of chemicals on the criterion of eco-economic threshold of harmful organisms;

Biological - use only natural resources: 24 t/ha of organic matter for soil fertility without making industrial agricultural chemicals, the use of complex biological product for seed treatment, biological crop protection tools.

Graduation second factor of primary tillage:

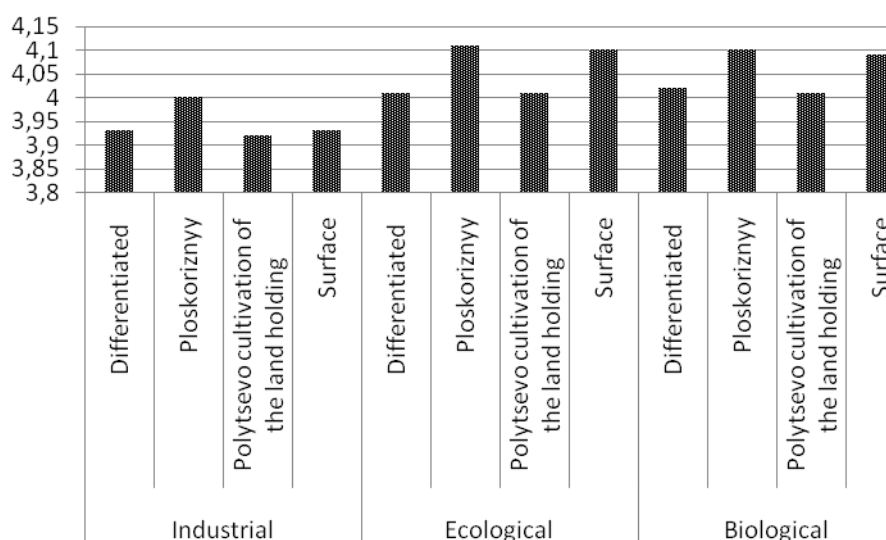
1) differentiated (control): wire for rotation rotation 6x plowing with different deepness, 2 single surface under cultivation of winter wheat after peas and corn silage and 1 single ploskoriznoho cultivation during barley ;

2) ploskoriznyy: soil preparation with different deepness loosening flat rotation under all crops except the surface under cultivation of winter wheat in the fields listed in the control ;

3) polytsevocultivation of the land holding: conduct by rotation rotation 2 single plowing under sugar beet , surface cultivation under winter wheat in the fields listed in the control and ploskoriznoho loosening under other crops;

4) Surface: holding disk tillage implements a depth of 8-10 cm for all crops rotation.

Results and analysis. The highest humus content marked on the background bezpolytsevyh cultivation for ecological and biological farming systems (Fig. 1).



$LSD_{05}A=0,02\%$; $LSD_{05}B=0,02\%$; $LSD_{05}AB=0,03\%$

Figure. 1 The impact of agriculture on the humus content in the soil layer 0-30 cm (in middle 2012-2013 yrs.)

Introduction not only fertilizer, but a sufficient amount of organic matter contributes significantly increase the humus content (0,2 %) , influenced by environmental and biological systems in comparison with the control.

The method of primary tillage also has a great influence on the formation of humus. For bezpolytsevoho cultivation tends to accumulate humus.

The term of forming during the cultivation is directly proportional to affect the state of microbiological activity. In the process of converting organic matter the fundamental role played soil microorganisms. Integrated index of soil biological activity is the total activity of microorganisms, determined by the intensity decay linen in the soil (Fig. 2).

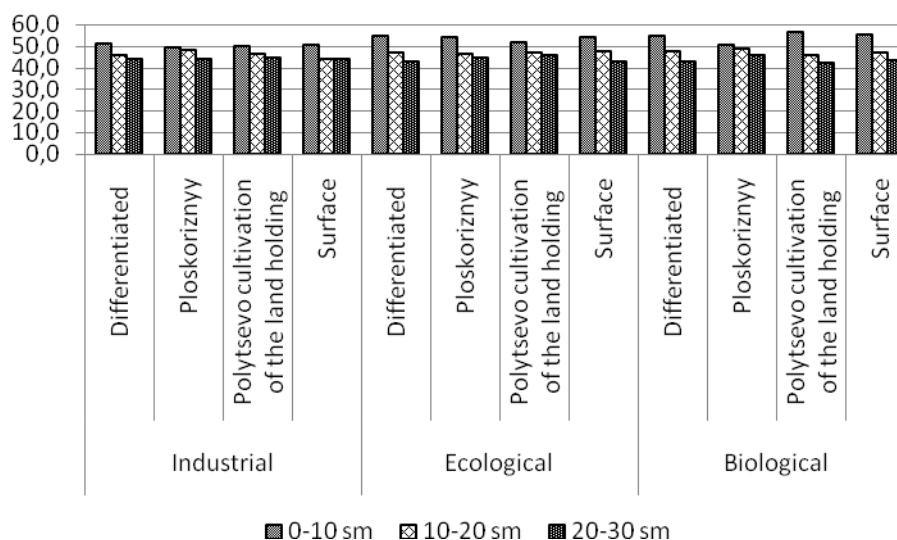


Figure. 2. Impact of agriculture on soil microbial activity (in middle 2012-2013 yrs.)

Studies indicate that the farming systems and tillage significantly affect the degree of decomposition of linen in the plow layer soil. With all the options the highest activity was observed in the layer of 0-10 cm.

Established between humus content in the soil microbiological activity and there is a strong direct correlation ($r = 0,78$).

The main summary measure of comparison of farming systems is the yield of sugar beet (Fig. 3). This comparison indicates a statistically significant decrease in the yield on biological farming systems (-17,78 t/ha).

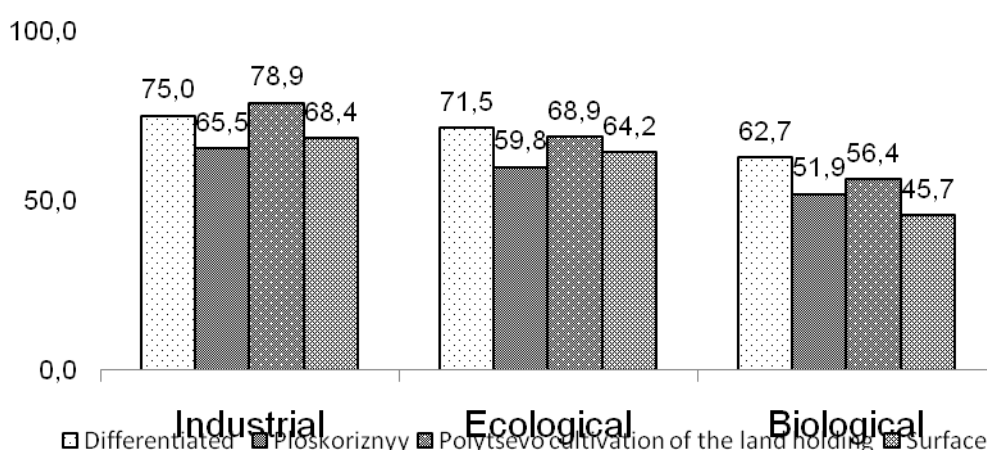


Figure. 3. Yields of sugar beet farming systems depending on the 2012-13 yrs., t/ha.

Conclusions. It was established that the use of environmental and biological farming systems promotes increase the biological activity of the soil and slowing the process of humus decomposition.

Application bezpolytsevyh cultivation in crop rotation reveals the accumulation of organic matter in the top layer of it, causing it higher microbial activity. For a evenly distributed of organic matter throughout the plow layer is proposed to use the system polytsevo - bezpolytsevoho tillage in crop rotation.

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