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**Seasonal dynamics of organic substances of typical black earth of Right-bank Forest-steppe region
depending on the level of**

The purpose. To determine Influence of alternatives of fertilizing on seasonal dynamics of organic substances of typical black earth.

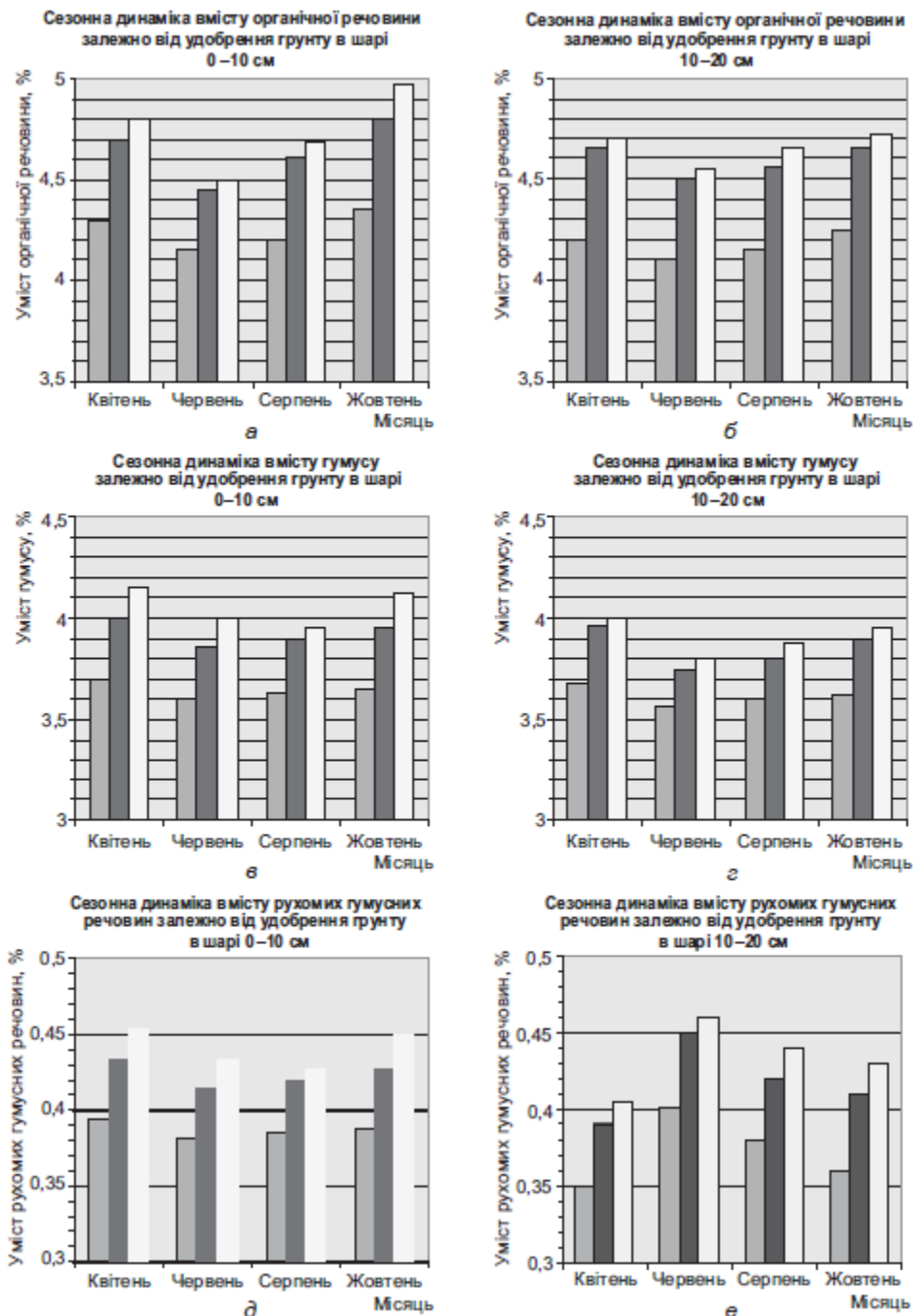
Methods. Field, laboratory-analytical, mathematical and statistical.

Results. It is fixed that use of straw and green manure crops together with fertilizers effects seasonal cyclicity of organic substances in typical black earth.

Conclusions. At use of fertilizer (straw 1,2 t/he+N₁₂+green manure crop+N₇₈P₆₈K₆₈) on typical sandy loam black earth of Right-bank Forest-steppe region It has been observed high amplitude of oscillation of the content of organic substance, humus, mobile humus matters from April till October. Entering of great quantity of fresh organic substance in soil has reinforced intensity of restoration of these indexes to reference level.

Key words: typical black earth, organic substance, humus, mobile humus matters, straw, green manure crops, fertilizers.

The basis for reproduction of soil fertility is the provision of a non-deficit balance of organic matter in it, which positively affects the basic properties of the soil and its fertility. Organic matter in the soil serves as the system coordinator of processes and regimes, provides the viability of microflora, favorable conditions and availability of nutrients for plants, accelerates the circulation of substances and the energy level of processes in the soil and plant. At the same time, more and more studies have shown that in the reproduction of fertility the most important role is not the general content of organic substances, but their mobile compounds [8, 12]. According to scientists [7], the decline in fertility of chernozem, which for a long time is in agricultural use, is explained not only by the decrease in the total content of humus, but by the loss of the seasonal rhythm of destruction and the formation of humus substances. As a result, black earths lose their fertility to a large extent, and organic fertilizers need to be used to produce high yields. Nowadays more and more researchers emphasize the need to restore the self-regulating function of chernozems as the basis for an expanded reproduction of their fertility and bioproductivity [4, 10]. In their opinion, the importance of soils is not so much the increase in the content of organic matter, but the restoration of its seasonal cyclicity [9]. The purpose of the research is to determine the influence of fertilizer on the seasonal dynamics of organic substances of typical black soil. Materials and methods of research. The research was conducted on a stationary study of the Department of Soil Science and Soil Protection named after prof. MK Shikuli in 2012 - 2014, laid in the research enterprise "Velosnatinskoye" of the Fastovsky district of the Kiev region on the chernozem typical lime-gravel.



Seasonal dynamics of organic matter content in chernozem is typical in soil layers 0-10 and 10-20 sm depending on fertilization: - without fertilizers (control); - straw 1.2 t / ha + N₁₂ + N₇₈P₆₈K₆₈; - straw 1.2 t / ha + N₁₂ + siderates + N₇₈P₆₈K₆₈

Fertilizer options (norms per 1 hectare of crop rotation): without fertilizers (control); straw 1.2 t / ha + N₁₂ + N₅₅P₄₅K₄₅; straw 1.2 t / ha + N₁₂ + N₇₈P₆₈K₆₈; straw 1.2 t / ha + N₁₂ + siderates + N₅₅P₄₅K₄₅; Straw 1.2 t / ha + N₁₂ + Siderates + N₇₈P₆₈K₆₈. As siderates after winter wheat, white mustard was planted with a yield of about 180 c / ha. Soil cultivation was generally accepted for this soil-climatic zone. The general content of humus and organic matter was determined by the Tiurin method in Simakov's modification [11], moving humus substances - in direct 0.1N extract of NaOH [6]. Research results. The study of the dynamics of the content of organic matter in chernozem was shown by the typical instability of its indicators throughout the year (figure). By determining the content of organic matter in different terms (April, June, August, October) there was a slight decrease in its amount during the period of active vegetation of plants and increase after harvesting of crops. It should be noted that the seasonal dynamics of the organic substance of chernozem corresponds to the peculiarities of phytocenosis development, when accelerated

growth of plants in the 1st half of the growing season is accompanied by an increase in microbiological activity and intensity of mineralization of humus [1]. Among the fertilizer options, the greatest influence on the restoration of organic matter in the soil was the introduction of straw and siderates against the background of mineral fertilizers. Under such conditions, irrespective of the soil layer, the highest amplitude of the annual fluctuation of the organic matter content was observed, with the smallest seasonal dynamics noted on the control. According to researchers [3, 14], the most effective replenishment of humus content is the replacement of manure with the combined use of siderates and non-consumable part of the crop. On average, winter wheat straw contains 95% organic matter, including 45% carbon, and siderates (white mustard) - 89% and 37% respectively) [3]. The highest cyclicity of humus content in the upper layers of soil was found in the fertilizer variant, which introduced straw and siderates against the background of mineral fertilizers. For such fertilization in the soil layer 0 - 10 cm, the amplitude of oscillation of humus content was 0.28%, in the layer 10 - 20 cm - 0.20%. Due to the arrival of a significant amount of straw and fresh biodegradable siderates, the microbiological activity in the soil increases and the humus content is restored to its original level. A somewhat lower cycle of humus content was found in the control and in the fertilizer application, where straw was introduced with mineral fertilizers, since under these conditions variations of the humus and the arrival of organic residues are less. If the accumulation of humus characterizes the general fertility of the soil, then its moving part is the closest reserve, which provides the plants with moving organic substances, creates favorable conditions for their development, provides high yields of agricultural crops. There are many different factors affecting the content and dynamics of moving humus forms. However, it is believed that fertilizer systems and vegetative plants have the most significant impact on the content of the humus. Thus, according to our researches, the highest content of mobile organic matter in all research facilities is observed at the beginning of the vegetation, when the vegetative mass is accumulated and the intensive absorption of nutrients contained in humus occurs and the microbiological activity of the soil increases. Under these conditions, the proportion of stable humus decreases and the content of moving humus substances increases significantly. Researchers have noted the positive effect of the removal of straw or siderates with mineral fertilizers on the restoration of organic substances in the soil [2, 13]. The results of our studies confirm that the highest level and amplitude of fluctuations in the content of moving humus substances are observed for the introduction of straw and siderates against the background of mineral fertilizers. Under these conditions the volatility of the amount of mobile humus substances reached up to 0.18%. This can be explained by the fact that the activity of microorganisms of the soil is intensifying, and the products of their half decomposition are the building material for the formation of young humus substances. On the control, the content of the humus part during the season was almost at the same level, where its seasonal dynamics was about 0.07%. This indicates a lack of accumulation of this component of humus due to the low level of fresh organic matter entering the soil.

Conclusions

For the use of fertilizer - straw 1.2 t / ha + N₁₂ + siderates + N₇₈P₆₈K₆₈ on chernozem, the typical loose-loam forest-steppe of the Right Bank has a high amplitude of fluctuations in the content of organic matter (up to 0.42%), humus (up to 0.28%) and mobile humus substances (to 0.18%) from April to October, and the arrival of a large amount of fresh organic matter in the soil increases the intensity of the restoration of these indicators to the baseline level.

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