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CONSERVATION OF FERTILITY OF CHERNOZEM ORDINARY IN THE CONDITION OF CLIMATE ARIDIZATION

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Actuality. In recent years, Ukraine has seen an increase in the impact of global warming on climatic conditions. The agricultural sector is the main one in the country's economy, so it is important to adapt crop production technologies to the current climatic conditions. Leading meteorologists of Ukraine note that agriculture is the most vulnerable sector of Ukraine's economy to fluctuations and climate change.

The issue of finding optimal tillage systems for the impact on crop yields has received considerable attention from scientists. At the same time, the impact of different tillage systems on fertility rates is important, especially in the context of modern global climate change.

The aim of the research was to evaluate the changes in fertility indicators of chernozem ordinary under different tillage systems in the conditions of climate changes.

Research methods. The study was conducted in a long-term experiment in the Dnipropetrovsk region in a field of corn for silage. The soil of the experimental site is chernozem ordinary medium humus heavy loam in the forest with a humus content of 4.60%, neutral reaction of the soil environment. The experiment included three variants of tillage systems: plowing by 23-25 cm; minimum cultivation of 4-5 cm and direct sowing (zero cultivation, No-till). Fertilizer and plant protection systems were the same in all variants of the experiment.

The soil samples determined the content of total humus by the Turin method in the Simakov modification, the structural-aggregate composition by the method of

sieving by Savvinov, the moisture content of the soil by the weight of the soil by weight.

Results and discussion. Deflationary considered stable aggregates larger than 1 mm. With their content over 60% deflation does not occur. Tillage systems directly affected the content of such particles during the cultivation of corn for silage. Wind erosion is one of the biggest threats to the soil cover of the steppe zone, with increasing arid climate, its destructive impact is only increasing. Analyzing the results of research, it should be noted the soil protective role of minimizing tillage. In the steppe zone, spring dust storms, which blow the top layer of soil, cause significant damage to crops. That is why it is important to ensure the optimal structural condition of the soil surface in the upper 0-10 cm layer of soil. The highest content of aggregates larger than 1 mm in this layer was observed at zero tillage and it was 62%, at the minimum the surface was also deflation-resistant, while in the variant with plowing the content of particles over 1 mm was only 49%. A similar trend was observed in the lower soil layers. In general, during the spring-summer period for growing corn for silage, the best deflation resistance of the surface in terms of aggregate content over 1 mm was observed for direct seeding.

An integral indicator of soil fertility is the humus content. Reducing the intensity of cultivation of chernozem ordinary ensured the preservation of organic matter. In 0-10 cm the humus content for direct seeding was 4.62; for the minimum - 4.61%, while for plowing - 4.58%. The average in the layer of 0-30 cm humus content was, respectively, 4.58% at zero tillage; 4.57 - for the minimum and 4.52% for plowing. It should be noted the positive effect of both minimal and zero tillage in preventing dehumidification of soils. Considering the fixation of carbon in humus, it should also be noted the reduction of its losses in the form of carbon dioxide.

On the conditions of climate changes, it is important to assess the moisture-preserving effect of various agronomic measures.

During the growing season, the moisture reserves in the soil naturally decreased. According to the results of the determination, the use of direct seeding provided the highest reserves of productive moisture during the spring-summer period - 44-112 mm

in a meter of soil thickness. Slightly lower stocks are observed at the minimum cultivation - 40-105 mm. The use of plowing caused the worst moisture retention in the 0-100 cm layer at the level of 35-98 mm.

Conclusions. As a result of the conducted researches it is established that application of the minimum and zero tillage provides preservation of fertility of chernozem ordinary in the conditions of the Northern Steppe of Ukraine. The content of aggregates larger than 1 mm in 0-10 cm layer of chernozem ordinary at minimum tillage was 60%, at zero - 62%, in the soil surface can be considered deflation-resistant, while during plowing the particle content was only 49%. Reducing the intensity of cultivation of chernozem ordinary ensured the preservation of organic matter: in the layer of 0-30 cm humus content was, respectively, 4.58% at zero cultivation; 4.57 - for the minimum and 4.52% for plowing. The use of direct seeding provided the highest reserves of productive moisture in a meter of soil during the spring-summer period, for plowing - the smallest.

Keywords: *soil fertility, climate aridization, chernozem ordinary, productive moisture, no tillage, humus, soil deflation*