

7. J. Six, H. Bossuyt, S. Degryze, K. Denef, A history of research on the link between (micro)aggregates, soil biota, and soil organic matter dynamics. *Soil Tillage Res.* 79, 7–31 (2004).

8. R. Backer, J. S. Rokem, G. Ilangumaran, J. Lamont, D. Praslickova, E. Ricci, S. Subramanian, D. L. Smith, Plant growth-promoting rhizobacteria: Context, mechanisms of action, and roadmap to commercialization of biostimulants for sustainable agriculture. *Front. Plant Sci.* 9, 1473 (2018).

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SOIL PROTECTION TECHNOLOGIES IN MODERN AGRICULTURE

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The ultimate goal of any business activity is to make a profit. The specificity of agriculture is that it depends on a huge number of factors that are not influenced by humans, but with the help of certain measures, it is possible to mitigate their negative effects. There are a number of technologies for growing agricultural crops, which differ among themselves in the systems of soil cultivation, fertilization and plant protection. The main requirements for them are the provision of high soil protection and economic efficiency.

The current state of the agricultural industry is determined by the global impact of technological modernization, which is not always appropriate and does not meet the actual needs and capabilities of agricultural producers. The special relevance of the introduction of the latest technologies in Ukraine is due to the growing problem of ecologically safe use of agricultural lands, which is associated with a decrease in their fertility, the spread of erosion processes, and an increase in the area of degraded and polluted lands. Therefore, Ukraine, striving to adhere to the main principles of agro-innovative development, should take into account the

peculiarities and possibilities of domestic agricultural production and the need to implement technological safety, check existing and implemented technologies.

The effectiveness of agrotechnical measures and cultivation technologies is determined by increasing the yield of agricultural crops. High yields of corn per silage were obtained on all fertilization options, except for the control. They were the largest with minimal tillage.

The highest productivity was noted for the combined application of mineral fertilizers, manure and straw, which is 3.3–3.9 t/ha higher than for ploughing. The introduction of mineral fertilizers ensured a yield increase of 3.1-7.8 t/ha under traditional technology and 4.3-9.4 t/ha against the background of soil protection. The yield increase from minimal tillage in this variant was within the limits of permissible deviations.

A higher yield was obtained in the variant where straw was used than when manure was used, which is explained by the introduction of nitrogen fertilizers.

With minimal processing, the level of profitability increased by 15.5 - 26.8%. The highest level of profitability was obtained on the option without fertilizers. The introduction of mineral fertilizers led to a sharp decrease in the level of profitability, due to their high cost. Of the fertilizer options, the organic-mineral fertilizer with the use of manure and straw turned out to be the most profitable (166% profitability level). The coefficient of energy efficiency - with minimal processing was also higher.

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**CHARACTERISTICS OF THE UPPER, MIDDLE AND LOWER
CARBONIFEROUS ROCKS OF THE SOUTH-EAST OF UKRAINE**

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