

UDC 631.46

**Zh. M.Gumarova**, Master of Natural Science  
Zhangir Khan West Kazakhstan Agrarian Technical University, Uralsk, Kazakhstan

### IMPACT OF BILOGIZATION ELEMENTS ON PRODUCTIVITY OF DARK CHESTNUT SOIL IN THE CONDITIONS OF DRY STEPPE ZONE

#### Abstract

The research on improving crop yields and increasing isolation cycle of matter and energy in agro-ecosystems based on natural reproduction of soil fertility through the use elements of biological function as a mulch of straw, manure compost humus showed the best conditions and increased soil biological activity

*Keyword: biologization, natural reproduction, soil fertility, humification.*

The study of soil as the main habitat is a very urgent problem of all organic life on Earth. At the present time the entire mass of food (about 98-99%) of humanity receives as a result of the cultivation of the soil, using a great feature - its fertility.

Currently, unfavorable climatic conditions causing recurring droughts create problems in crop production, creating a rise in prices for food products [1].

The given shortage of manure and compost – the main types of organic fertilizers – an important source of organic matter may be the straw of winter crops, 1 ton which the content of organic matter, nitrogen, phosphorus and potassium and the influence on the reproduction of humus is equivalent to 2.5 tons of solid manure. In agriculture, each year can be used as fertilizer (without alienation from the fields) up to 45-50 mln. tons of straw that the content of organic matter corresponds to 150 million tons of solid manure. The use of straw as an organic fertilizer is 4 times cheaper than using an equivalent amount of agronomic efficiency of manure. Especially important this technique in private (peasant) farms, where small livestock and limited range of crops. Element biologization - straw in agriculture, it has the most favorable conditions for the absorption of water in the soil, reduce runoff, improve the physical and chemical properties and structure of arable layer reduces the evaporation of moisture. Researches on modeling of mulching with straw by imposing mulchplast different mass held on the southern calcareous chernozem in the 1968-1983 biennium. These studies have shown high efficiency of straw mulch on soil moisture conservation and increased yields of spring wheat.

The use of chopped straw as organic fertilizer gives great opportunities to improve soil fertility in our area. Thus, the straw winter crops, primarily rye, which is low fodder value may become the main material for fertilizers. The straw left on the soil surface, protects it from blowing reduces useless expenditure of moisture by evaporation and in a grain farming is the only source of organic fertilizer and soil fertility, enhance their biological activity. Evenly scattered across the field straw in the hot summer protects the soil from drying, weathering, seals and loss of humus. Mulching sites chopped straw can improve air and water regime of soil structure, which undoubtedly affects the strength and fertile loam and heavy dark chestnut soils. The structural soils compared to unstructured created more favorable conditions for water, air, heat and nutrient regimes. Mulching areas also affects the activation of soil organisms, which has theoretical and methodological value [2].

All this forces to undertake the development of biological methods of crop improvement based on natural reproduction of soil fertility, increase in the closure cycle of matter and energy in agro-ecosystems, reducing the impact of chemicals on the environment and the quality of the products obtained.

Therefore, at present the development of practical methods of environmentally friendly agriculture and to study their effects on soil fertility and productivity of cultivated crops is highly relevant and promising challenge [3].

Straw mulchplast created by the imposition of an annual background check on the straw in parameter 3 t/ha.

Our studies have shown that in the rotation with plowing manure and laying mulch piled up, the best

conditions for the formation of new humus and the actual content of humus in the topsoil increased (table 1).

Table 1– Changing the content of humus in the dark chestnut soil depending on the application of biologization of elements, %

Variant of experiment	The humus content in the 0-40 cm soil layer
Black fallow (control)	2,7
Black fallow + t / ha of manure	2,2
Black fallow + t / ha of manure + mulch of straw	3,4

Content humus depends not only on the amount of organic matter entering, but the intensity of the biological processes occurring in the soil. The latter was determined in an experiment on the decomposition of linen fabric and varied by crop rotation. So in rotation with fallow, decomposition of linen in the 0-20 cm layer costavilo 21.2%. B rotation with plowing manure and mulch of straw in the fallow soil biological activity is higher at 35% and manure decomposition of linen - 27% (Fig 1).

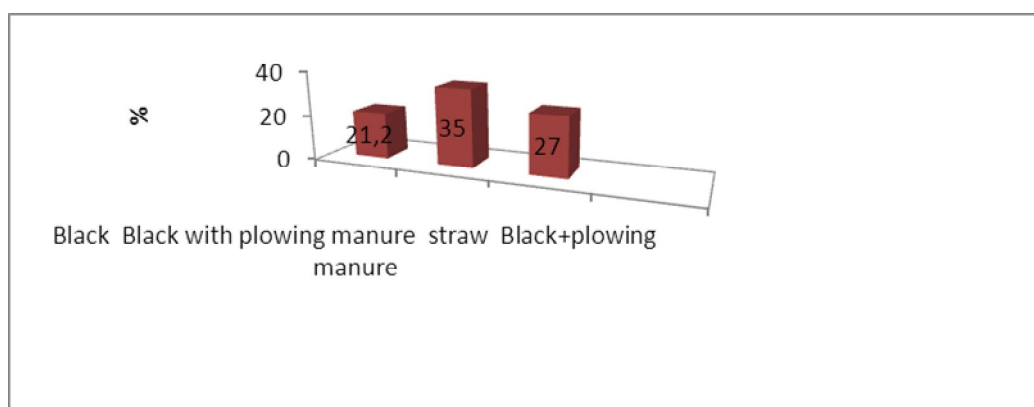


Figure 1 – The impact of steam on the cellulolytic activity of topsoil, %

Thus, the study identified changes in areas such as improving the humus and soil biological activity of the pulp web have confirmed the status quo on the benefits of mulching.

#### REFERENCES

- 1 Orlova L.V. Scientific and practical guidance on the development and application of conservation farming techniques / Samara, 2005.– 137 p.
- 2 Alpatyev A. M. Hydrologic cycle of crops / A.M. Alpatyev. 1954. – 248 p.
- 3 Kucherov V.S. Biologization of agriculture in the North-West of Kazakhstan / V.S. Kucherov, A. S. Saparov, T. Yu. Chernoyarova // Proceedings of the international conference dedicated to the 60th anniversary of the institute of soil science named U.U.Uspanov, «Status and perspectives of soil science». – Almaty, 2005. – P.17.

#### ТҮЙІН

Бұл мақалада ауылшаруашылық дақылдардың өнімділігін көтеру мақсатында, шөптердің мульчепластымен көнді пайдалану биологизация жолдарының топырақтың биологиялық белсенділігімен қоса құнарлығының көтерілуіне ықпалы зор екендігі баяндалады.

#### РЕЗЮМЕ

Исследования по повышению урожайности сельскохозяйственных культур, основанные на естественном воспроизводстве плодородия почвы путем применения таких элементов биологизации как мульча из соломы и навозный компост, показывают наилучшие условия гумусообразования при одновременном повышении биологической активности почв.