

**СЕКЦІЯ 6. РОДЮЧІСТЬ ҐРУНТІВ У ЗАБЕЗПЕЧЕННІ
ПРОДУКТИВНОСТІ ГАЛУЗІ. ШЛЯХИ ЗБЕРЕЖЕННЯ ТА
ВІДТВОРЕННЯ ҐРУНТІВ**

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**THE POSITION OF ALFALFA IN THE BIOLOGIZATION OF
AGRICULTURE IS AN ECONOMIC ASPECT**

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One of the important problems in the agricultural world in recent decades are issues related to the preservation and reproduction of soil fertility. They are especially relevant under modern economic conditions, when they neglect compliance with the basic laws of agriculture: they do not introduce crop rotations, practically do not introduce organic fertilizers, which are deficient due to a decrease in the number of cattle. Soil degradation has been noted: fertility indicators are deteriorating, the structure of the soil is being destroyed, density is increasing, wind and water erosion are increasing, etc.

According to the State Institution “Derzhbruntokhorona”, which conducted a soil survey in 2011-2015, the weighted average humus index in Ukraine was 3.16% (which corresponds to an increased level of security), in particular in the Steppe zone – 3.45%, Forest–Steppe – 3.21%, and the lowest – in Polissya - 2.33%. In the regions of the southern Steppe, its value was: in the Odessa region – 3.77%, Mykolaiv – 3.27%, Kherson – 2.45% [1, 2].

According to available data, in 2011-2015 in Ukraine the humus balance was fixed at minus 0.13 t/ha, in particular in the southern regions the indicator was significantly worse than the national one (in Mykolaiv – minus 0.39 t/ha, in Odessa and Kherson regions – minus 0.54 t/ha).

It is generally recognized that one of the ways to preserve and reproduce soil fertility is the cultivation of perennial grasses, which are considered one of the components of the biologization of agriculture. At the same time, the areas of their crops are significantly reduced.

With the current level of feed production to increase the yield of perennial grasses, in particular alfalfa, monetary and energy costs for fertilizers, pesticides, machinery are significantly increasing, far exceeding the standards. Quite often, alfalfa hay is harvested on farms (4, 5 years of life), which already forms a low yield, but still remains a source for the production of feed. We have conducted research in order to find ways to increase the productivity of such crops. Two factors were included in the scheme of the

experiment: factor A – doses of fertilizers (without fertilizers, fertilizing agrofitecnozis in spring N10P10K10); factor B – crops (alfalfa without sowing – control, alfalfa with spring barley Adapt, alfalfa with spring barley Stalker).

The use of monetary resources requires a thorough analysis and determination of the effectiveness of the proposed elements of technology. The costs for the production of alfalfa hay include labor remuneration, depreciation of fixed assets, material costs (the cost of working capital: fuel, fertilizers, seeds, etc.). The obtained results make it possible to assert that the largest funds are spent on fuel. On average, over two years of research, in a single-type control sowing of alfalfa without fertilization, this indicator amounted to 920 UAH/ha. In connection with the introduction of mineral fertilizers, it increased to 970 UAH / ha, or by 5.4% (at 2017 prices). The largest funds for fuel were spent for growing old alfalfa mixed with sown spring barley of the Adapt variety against the background with the introduction of fertilizers N10P10K10 – 60 kg /ha – 1019 UAH/ha, which is 10.8% higher than the benchmark. Six hundred six UAH/ha was spent on the purchase of mineral fertilizers, and 500 UAH/ha was spent on spring barley seeds.

Labor costs were significant. So, in the monoid control sowing of alfalfa without fertilization, this indicator amounted to 732 UAH/ha. Due to the introduction of mineral fertilizers, it increased to UAH 799/ha, or 9.2%, which is explained by the high costs of harvesting a high hay harvest. Compaction of alfalfa crops with old spring barley of the Adapt variety caused an increase in labor costs against control on non-winded crops by 122 UAH /ha, or by 16.6%, and Stalker variety—slightly less (by 14.8%).

The largest funds for labor were spent for growing old alfalfa mixed with sown spring barley of the Adapt variety against the background with the introduction of fertilizers N10P10K10 – 881 UAH / ha, which is 20.3% higher than the benchmark. This is also due to the significant costs of harvesting a larger crop of hay. Hence, direct and total production costs were the highest precisely in the production of alfalfa hay mixed with sown spring barley of the Adapt variety against the background with the introduction of fertilizers N10P10K10 – 3006 and 3307 UAH/ha, respectively, which is 82.3 and 82.0% higher than the benchmark, which did not have additional costs for sowing spring barley (sowing) and fertilization.

The lower expenditure of monetary resources on control can be explained by the fact that it is not necessary to buy alfalfa seeds and carry out energy-intensive basic tillage and sowing. The largest costs for control sowing in the structure of total production costs are again inherent in fuel. This indicator reached 50.6%, whereas when growing old alfalfa for hay mixed with sown spring barley of the Adapt variety against the background with the introduction of fertilizers N10P10K10, it was less – 30.8%.

With other models of hay production technologies, there is also a tendency to increase fuel costs in the structure of total production costs.

The share of labor costs was somewhat smaller. Fluctuations of this indicator were determined within 26.5%, when compacting alfalfa crops with an old variety of spring barley Stalker against the background with the introduction of fertilizers N10P10K10. At the control sowing in the structure of total production costs, this indicator reached the level of 40.3%.

Significantly less in the structure of total production costs on a fertilized background were the costs of purchasing fertilizers – 18.5 and 23.2% and seeds – 15.2 and 15.1% in the variants with a load on alfalfa varieties of spring barley Stalker and Adapt, respectively.

It is worth noting that in variants with high production costs, high profits per unit area were also obtained. For compaction of alfalfa with a variety of spring barley Stalker with fertilizers, the profit amounted to 5879 UAH / ha. This indicator was more significant against the background of the application of mineral fertilizers N10P10K10 in early spring for compaction of alfalfa plants with spring barley of the Adapt variety – 5993 UAH/ha with a reference value of 4803 UAH/ha.

Thanks to the introduction of mineral fertilizers N10P10K10 in early spring, the yield of alfalfa hay in monoid sowing increased by 8.2 c/ha, or 24.8%, and for compaction with spring barley varieties Adapt and Stalker—within 13.4 and 12.7 c/ha, or 40.5% and 38.4%, respectively, against the control on which it was harvested 33.1 c/ha of air-dry matter. As evidenced by the above analysis of calculations of the economic efficiency of growing alfalfa for hay, according to the main economic indicators, the best option is to seal crops with sown spring barley, in particular with the Adapt variety with the application of mineral fertilizers N10P10K10 in early spring. This provides an increase in the value of gross output from 1 ha to the level of 2680 UAH against control.

It is worth noting that the cultivation of such a mixture for fodder purposes slightly increases the cost of hay, the level of profitability, but at the same time the labor intensity of products decreases by 18.4%, labor costs per 1 ton of hay decrease from 0.285 to 0.232 people a year. The increase in net profit is growing from 1 ha to 1190 UAH against control. A slightly lower level of profitability compared to the Adaptation variety was obtained for planting on the alfalfa of the Stalker variety. However, according to such indicators as the labor intensity of products, labor costs per 1 ton of hay, net profit per 1 ha, this hay production option had advantages over the control sowing of alfalfa.

Taking into account the above results of calculations of economic indicators, it can be concluded that the compaction of alfalfa crops with old-fashioned barley sown with spring varieties Adapt and Stalker with the addition of mineral fertilizers N10P10K10 in early spring is a fairly effective measure in the production of hay.

Since alfalfa is a high-protein forage crop, besides annually accumulates environmentally friendly nitrogen in the soil, prevents the manifestations of erosion processes, the expansion of its crops is an objective necessity to ensure a deficiency-free balance of nutrients and the preservation of soil fertility.

References:

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