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NUTRITIONAL VALUE OF FEED OF ALFALUM-CEREAL GRASSES DEPENDING ON FERTILIZATION IN THE CONDITIONS OF THE RIGHT BANK

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Abstract. The results of research on the influence of mineral fertilizers on the nutritional value of forage of alfalfa grasses are presented. It was found that the application of nitrogen fertilizers significantly improves the supply of feed to digestible protein in cereal crops. Nitrogen fertilizers in the norm of N_{60} on the background of $P_{60}K_{90}$ on cereal grassland increased the supply of feed unit with digestible protein by 26 g, on alfalfa and alfalfa-grass grasslands - by 5-14 g.

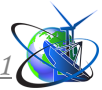
Key words: alfalfa-cereal grass mixtures, feed nutrition, feed unit, metabolic energy.

Introduction.

One of the ways to increase the economic efficiency of the livestock industry is to actively involve natural forage lands in the formation of the fodder base of farms. The total area of such lands in Ukraine is approximately 7.8 million hectares, including 1 million hectares in the right-bank forest-steppe. However, their average productivity rarely exceeds 1.0-1.2 t / ha of feed units.

The nutritional value and productivity of perennial forage grasses significantly depend on soil and climatic conditions, species and varietal composition of meadow grasses, the mode of their use, norms and terms of application of mineral fertilizers and other agronomic techniques [1, 2, 5].

One of the effective means of increasing the productivity and nutrition of the fodder mass of meadow grasses is the introduction of leguminous grasses into their composition. The leading place among leguminous components of meadow perennial phytocenoses is occupied by alfalfa, a culture that actively uses the moisture reserves of the autumn-winter period to form a high yield of vegetative mass even in the spring drought [3, 6, 8].



Among the technological factors to increase the productivity and nutritional value of fodder sown legume-cereal meadow phytocenoses, the most controversial is the application of mineral fertilizers, especially nitrogen. On nitrogen-poor soils, as a result of a high level of biological fixation of atmospheric nitrogen by legumes of symbiotic nitrogen from the atmosphere, crops form a higher yield of vegetative mass. In soils rich in nitrogen, legumes significantly reduce their potential for nitrogen fixers. In general, meadow phytocenoses of different botanical composition react positively to the application of mineral fertilizers [4, 7, 9].

The purpose of the research is to study the influence of technological methods of growing alfalfa-grass mixtures on fodder nutrition in the conditions of the Right-Bank Forest-Steppe.

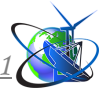
Materials and methods of research.

Field experiments were conducted in 2014-2016 in the research field of the Department of Forage Production, Land Reclamation and Meteorology (SE NULES of Ukraine "Agronomic Research Station"). The technology of growing perennial grasses is generally accepted for the Forest-Steppe of the Right Bank of Ukraine, except for the factors that have been studied. Phosphorus and potassium fertilizers in the norm of P₆₀K₉₀, were applied annually in autumn according to the scheme of the experiment. Nitrogen fertilizers in the norm of N₆₀ were applied in three steps: N₂₀ in the spring on permafrost soil and after the first and second mowings - on N₂₀. Grass treatment with Fumar growth stimulator was performed at the beginning of regrowth of grasses of each slope at a dose of 2 l / ha with a water consumption of 200 l / ha in the period. The soil of the experimental field is typical low-humus chernozem. The content of humus in the arable layer - 4.2-4.6%, mobile phosphorus (according to Machigin) - 40-55 mg / kg of soil, exchangeable potassium - 150-165 mg / kg of soil, easily hydrolyzed nitrogen (according to Cornfield) - 140-160 mg / kg, pH of the salt extract - 6,7-7,0.

Research results and their discussion. When using the obtained grass fodder in animal feed, it is important to evaluate it according to the indicators provided by the current standards of Ukraine for the evaluation of feed quality. According to the obtained data, the content of feed units in the dry mass of different types of grass stands was 73-82%, metabolic energy - 8.6-9.5 MJ / kg, the supply of one feed unit with digestible protein - 107-174 g (table).

It is established that the inclusion of alfalfa sowing in the composition of alfalfa-cereal grass mixtures contributed to the increase in the content of feed units in the dry weight of grass from 73-75 to 76-78%, and the content of metabolic energy - from 8.6-8.8 to 8.9-9.2 MJ / kg compared to pure cereals.

Comparing the obtained values of these indicators on alfalfa-grass stands with single-species sowing of alfalfa, it was determined that alfalfa sowing is characterized by slightly higher nutritional value and energy consumption. Its dry mass contained 4-6% more feed units and 0.3-0.5 MJ / kg more metabolic energy. Under the influence of fertilizer, the parameters of nutrition and energy intensity changed little, there was only a tendency to increase the parameters of these indicators. The supply of feed unit with digestible protein in the studies was quite high and, depending on the effect of the studied factors was 107-174 g. This indicator was mostly influenced by symbiotic



Nutrition, energy consumption of dry mass and provision of fodder unit with digestible protein of meadow grasses depending on fertilizer

Fertilization	The content of feed units. %	Exchange energy content. MJ / kg	Security feed unit digestible protein. g
Medicago sativa			
No fertilizers	81	9.4	151
P ₆₀ K ₉₀	82	9.5	154
N ₆₀ P ₆₀ K ₉₀	82	9.5	164
N ₆₀ P ₆₀ K ₉₀ + Fumar	82	9.5	170
Medicago sativa + Festuca orientalis + Festuca pratensis			
No fertilizers	76	9.0	152
P ₆₀ K ₉₀	77	9.1	155
N ₆₀ P ₆₀ K ₉₀	76	9.2	160
N ₆₀ P ₆₀ K ₉₀ + Fumar	77	9.2	167
Medicago sativa + Festuca orientalis + Dactylis glomerata			
No fertilizers	76	9.0	155
P ₆₀ K ₉₀	78	9.1	152
N ₆₀ P ₆₀ K ₉₀	77	9.2	165
N ₆₀ P ₆₀ K ₉₀ + Fumar	77	9.2	168
Medicago sativa + Bromopsis inermis + Lolium perenne			
No fertilizers	76	8.9	158
P ₆₀ K ₉₀	77	9.1	158
N ₆₀ P ₆₀ K ₉₀	78	9.1	168
N ₆₀ P ₆₀ K ₉₀ + Fumar	77	9.2	174
Medicago sativa + Bromopsis inermis + Festuca orientalis			
No fertilizers	76	9.0	156
P ₆₀ K ₉₀	77	9.1	158
N ₆₀ P ₆₀ K ₉₀	76	9.2	172
N ₆₀ P ₆₀ K ₉₀ + Fumar	77	9.2	173
Bromopsis inermis + Festuca orientalis (cereal grassland)			
No fertilizers	73	8.6	107
P ₆₀ K ₉₀	74	8.7	112
N ₆₀ P ₆₀ K ₉₀	75	8.8	138
N ₆₀ P ₆₀ K ₉₀ + Fumar	75	8.8	143
Zootechnical norm	70-100	8-11	110-115
SSD ₀₅ , %	4,5	1,2	12

and mineral nitrogen. With the inclusion of alfalfa in cereals, as well as in pure alfalfa crops in the absence of nitrogen fertilizer, the supply of feed unit digestible protein increased from 107-112 g to 151-174 g or 44-62 g, for the introduction of mineral nitrogen - from 138- 143 g to 160-174 g or 22-31 g. Among legume-cereal grass



mixtures, no significant difference was observed in the supply of the feed unit with digestible protein.

The application of nitrogen fertilizers improved the supply of the feed unit with digestible protein more significantly on cereal grass crops than on alfalfa and alfalfa-grass stands. Nitrogen fertilizers in the norm of N_{60} on the background of $P_{60}K_{90}$ on cereal grassland increased the supply of feed unit with digestible protein by 26 g, on alfalfa and alfalfa-grass grasslands - by 5-14 g. The highest nutritional value of fodder on this indicator on all grasses was noted for the introduction of $N_{60}P_{60}K_{90} + \text{Fumar}$ and was on alfalfa and alfalfa grasses - 167-174 g (excess to control 13-19 g), on grasses - 143 g (increase to control was 36 d).

Conclusions.

The application of nitrogen fertilizers significantly improves the supply of the feed unit with digestible protein in cereal crops. Nitrogen fertilizers in the norm of N_{60} on the background of $P_{60}K_{90}$ on cereal grassland increased the supply of feed unit with digestible protein by 26 g, on alfalfa and alfalfa-grass grasslands - by 5-14 g.

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