

**AREA OF LEAF SURFACE AND YIELD CAPACITY OF PERENNIAL
GRASSES IN RELATION TO ITS STRUCTURE AND LEVEL OF MINERAL
NUTRITION**

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The author determines the issue of increasing the production of high-quality feed of perennial legumes and cereal grasses, installed as changed area of leaf surface and yield of the grass stand depending on the structure and level of mineral nutrition for conditions of the Right-Bank Forest-Steppe of Ukraine.

Alfalfa crop, perennial cereal grasses, awnless brome, area of leaf surface, yield of the grass stand

In terms of market relations and financial crisis of Ukrainian agriculture, more and more important become crop hayfields as a source of high nutrient and the cheapest fodders and the basis of competitive production of animal products. Crop hayfields and pastures are widely recognized in most countries in the world, where they serve as a reliable basis for profitable meat and dairy cattle breeding and obtaining the most valuable foods for people.

Besides, perennial grasses do not only have measurable benefits in getting cheap and high quality fodders to other feed crops, but also perform a significant ecological role in agricultural landscapes. They protect soils from erosion, and water sources – from pollution with agricultural chemicals, so they are powerful natural biofilters, while being an important reserve of saving valuable genofond of plants and wild animals and have great aesthetic and recreational value.

The aim of the research was to investigate the change of the leaf area and the yield of the grass stand, depending on its composition and level of mineral nutrition in terms of Right-Bank Forest-Steppe zone of Ukraine.

Materials and methods of research. The research was carried out in crop rotation of the Department of Fodder Production, Land Reclamation and Meteorology of the Separated Subdivision of the National University of Life and Environmental Sciences of Ukraine “Agronomic Research Station” (ARS) since 2005 in accordance with conventional methods. The area of land is mainly undulating terrain with small, elongated degradations.

The soil of the research field is typical black soil.

Total area under experiment is 2000 mI; total area of the plot – 20 mI; accounting plot area – 12 mI; repetition – quadruple.

All phenological observations, biometric measurements and counts, as well as biochemical analyzes were performed by conventional methods [5, 6].

Results. Leaf area. Due to the fact that leaves are the main body of the photosynthetic activity of plants, where it is formed organic matter, assimilation surface area of any crop largely determines its yield.

The research showed that the area of leaf area of perennial grass stands changed and depended on their composition, mineral nutrition level and haymaking.

According to the Table 1, with the improvement of mineral nutrition in all investigated grass stands it increased leaf-area duration. Thus, grass stands grown in variants without fertilizers (control), depending on the haymaking formed leaf area within 17.6-41.4 thousand mI/ha. Adding phosphorus-potassium fertilizers R90K120 boosted this figure to 19.4-50.2 thousand mI/ha. The most significant increase in leaf-area duration in the investigated grass stands was due to use of mineral nitrogen N90 together with phosphorus-potassium background R90K120. In such terms, grass stands, depending on their composition and haymaking, formed leaf area within 23.1-56.4 thousand mI/ha.

The experimental data showed that the leaf-area duration in the studied grass stands also changed according to the haymaking. It was established that all studied

grass stands formed much bigger assimilation area in the first (26.8-56.4 thousand mI/ha) than the in the second (17.6-38.8 thousand mI/ha) haymaking.

Besides, according to the study the biggest leaf-area duration in all the variants on fertilizing during the growing season was in grass stand which consisted of black medic and smooth brome (28.3-56.4 thousand mI/ha). The yield of this grass stand appeared to be the highest as well.

The yield of perennial grasses depends on a significant number of factors. The greatest influence on this indicator has light, heat, air, water and soil nutrient regimes.

During the research it was studied how the dependence of grass stand productivity on its composition and level of mineral nutrition.

According to the research, yield of the studied grass stands depended on their composition and level of mineral fertilizing. Thus, the lowest dry matter yield (from 31.5 to 42.2 kg/ha) was observed in variants without the use of fertilizers. Adding phosphorus-potassium fertilizer R90K120 for perennial grass stands helped to increase their productivity up to 42.6-68.4 kg/ha of dry matter. The most significant influence on the increase in this indicator had application of a complete mineral fertilizer N90R90K120. Depending on the composition of the grass stand, its yield was within 63.8-75.6 kg/ha of dry matter.

However, it should be noted that the studied grass stand yield in the second haymaking decreased by 35.0-40.2%.

Conclusions

So, in terms of the black soils of the Right Bank Forest-Steppe zones of Ukraine, in order to obtain high-quality fodders with high protein, it is necessary to grow grass stands consisting of black medic and smooth brome, using mineral fertilizers N90P90K120.

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