

## **AGRICULTURAL SCIENCES**

### **FEATURES OF FORMATION OF MEADOW GRASSES IN THE RIGHT-BANK FOREST-STEPPE OF UKRAINE**

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The increasing demand for safe and nutritional dairy and beef products in a globalising world, together with the needs to increase resource use efficiency and to protect biodiversity, provide strong incentives for intensification of grassland and forage use [1].

The field of cattle breeding has been traditionally and remains one of the leading ones for Ukraine [2].

In Ukraine, for most rural households, livestock production has become a means of survival, a source of cash and food. Households provide 76% of beef production. The main problem of the beef market is the reduction of the commercial attractiveness of the livestock industry, which leads to a reduction in the number of cattle and, consequently, a reduction in meat production [3].

Livestock productivity and the resulting economic benefits for smallholder farmers are constrained by a limited supply of quality feed [4].

To improve the efficiency of the livestock industry and to create a stable forage base and simultaneously improve the environmental situation by restoring the cultivation of perennial meadow grass on

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degraded grasslands and on arable lands erosion-prone areas agricultural lands.

Meadow herbage provides the cheapest forage, and hence the cheapest livestock products. The increasing in the proportion of high quality grass forages from 55–60 % to 85% in the diets when fed to cattle gives an opportunity to reduce cost of livestock production by more than 30% [5].

Different types of technologies have been developed to address the issue of inadequate livestock feed supply, which is necessary given the diversity of feed resources used to feed livestock [6].

The urgency of the problem necessitated the study of the features of formation of meadow grasses in the Right-bank Forest-steppe of Ukraine.

The research was conducted in NSC “Institute of agriculture NAAN”. Experience laid down by overseeding of legumes and grasses in old cereal herbage in 2013 on land with gray forest soil, which are in the 0–10 cm layer contained 1.94–2.07% of humus, of alkaline hydrolyzed nitrogen – 67.9–74.9 to, mobile phosphorus – 15,5–21,0 and 7.5–10.4 mg/100 g of soil of exchange potassium with a pH of 5.4 to 5.5. Registered varieties of legumes and grasses were used. Investigation held at three fertilizer and two regimes of use. Phosphate and potassium fertilizers made in one term, nitrogen – in four equal portions during each mowing by using four mowing ( $N_{140 (35 + 35 + 35 + 35)}$ ) and two terms for two mowing ( $N_{140 (70 + 70)}$ ).

Replication of the experiment is fourfold. The size of cultivated plots – 10.5 m<sup>2</sup>, of accounting plots – 3.15 m<sup>2</sup>. On the research plot in the fall of 2013 was made superficially lime (CaCO<sub>3</sub>) at a dose of 5 t/ha. The experiments were performed according to standard techniques of research, which are used in forage production [7]. Was applied the following research methods: field, laboratory and mathematical and statistical.

The research results indicate that on fallows had dominated perennial not-sowed grasses (59–82%). On the improved fallow land 2 a significant proportion (7–12%) occupied sowed species narrow-leaved bluegrass (*Poa angustifolia* L.) and Welsh fescue (*Festuca valesiaca*) that points on the creation of sustainable balanced and capable cenosis. In the composition of the meadow grass canopies revealed 53 species of herbaceous plants. The species composition of fallow lands for years of research had varied weakly.

The largest proportion of legume component in legume-cereal grass stands average for the years of use observed in the Lotus-cereal – 33–50% and Alfalfa-cereal cenosis – 23–46%, where they were held for three years of use. The red clover (*Trifolium pratense*) and white clover (*Trifolium repens*) with a share 36–53% – only during the first two years.

Average for the years of use on seeded cereal grass stand the proportion of additional sowing grasses (fescue meadow (*Festuca pratensis*) and awnless brome grass (*Bromus inermis* Leyss) for both modes of use was 52–70%. In the third year seed cereal grass stand, red clover and white clover-cereal grass canopies transformed in awnless bromus group.

For both modes the use of natural and seeded meadow grass canopies were formed with a density of 1524–2594 of shoots per 1 m<sup>2</sup>. For dual use average height of wild and cultivated grasses ranged from 33–109 cm and four mowing use – 23–58 cm. Greatest height was characterized awnless brome grass – 139 cm and the lowest – white clover (13 cm) between seed herbs. Additional contributions N<sub>140</sub> on seeded grass herbage and fallow lands increased height of herbage in 1.2–1.8 times and the addition to sowed grains of legume component in 1.1–1.3 times.

The highest productivity on average for three years provided the alfalfa-cereal grass canopies, where the different backgrounds of fertilizers obtained 6.13–9.73 t/ha dry mass, of 5.36–6.81 t/ha of fodder units, 1.23–1.69 t/ha of crude protein, 63,790,5 GJ/ha of exchange

energy, with the compensation level of mineral nitrogen by symbiotic 149–182 kg/ha, 1.3–1.6 times more compared with other legume-cereal grass stands, 2.2 times – to seed cereal grass and 2.7–3.3 times more compared with fallows.

For input of  $N_{140}$  productivity of seeded cereal grass and fallow herbage increased 1.6–1.8 times with a payback of 1 kg of nitrogen by crops dry mass of 10–20 kg. Improved uniformity of distribution of the harvest of the mowing and stability over the years. Additional contributions of the  $N_{140}$  still  $P_{60}K_{120}$  not significantly increased the productivity of grass herbage. Legume-cereal grass stands and with the inclusion of alfalfa (*Medicago sativa*) small reacted to nitrogen fertilization. Dual-mowing usage compared to four-mowing usage all the grass canopies provided better productivity.

Were determined the high efficiency of ancient sowed grass herbage productivity recovery by overseeding of sod by seeds of perennial cereal and legumes grasses. Overseeding of perennial legumes to cereal grass for both usage, contributed to the improved productivity in the 1.4–2.2 times, and fallow grass stands – of 1.8–3.3 times on the background without fertilizers.

It is proved that the formation of herbage productivity was the most influential factor “type of grass stands” with a share of 58 to 63%, in second place – “fertilizers” (26–35%).

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