

EVALUATION OF FECUNDITY OF PERENNIAL RYEGRASS OF DIFFERENT GENETIC ORIGIN

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Due to climate change there is a growing interest in sustainable agriculture, which contributes to the conservation of natural resources. Grasslands of different composition do not only lead to an increase in biodiversity, but also enhance the environmental function of grasslands [2]. Perennial ryegrass has been cultivated in Europe for many years because of its good yield and good forage quality. It has started to be grown in Lithuania with the development of new varieties that are more resistant to adverse meteorological conditions. Cultivating the mixtures of different crops can also be one of the sustainable means of increasing agricultural productivity, but it is essential to optimize functional diversity by combining the distinct characteristics of not only species but also of varieties, that are best suited to local growing conditions [1].

So far studies have focused on the overall productivity of grassland and its forage value, as well as how individual species can help each other. However, only few varieties of different species have been analyzed in the mixtures. The intensity of growth of individual varieties may vary in case of different intensities and types of stress, which may affect the condition of grasslands.

Perennial ryegrass (*Lolium perenne* L.) is one of the most valuable *Poaceae* grasses and is a major component for perennial grasslands and pastures. In our study three new tetraploid perennial ryegrass 'Elena DS', 'Raminta', 'Verseka' (Lithuanian varieties) were used. The use of nutritional resources is a very important factor in the competition and compatibility of species and their quality existence, productive growth in the same place at the same time. To meet the nutrient requirements of the agroecosystem, biological nitrogen fixing legumes were used in the mixtures, which are compared to the effects of mineral fertilizers in homogeneous grasslands.

The obtained results showed differences between the cultivated perennial ryegrass varieties, however no significant differences were found between them. Perennial ryegrass 'Elena DS' had the best growth properties. The annual dry matter yield of this plant was the highest 7011 t ha⁻¹, the annual yield of 'Raminta' was 5.4% lower. 'Verseka' variety also showed good growth properties. The mixture of three varieties growing together showed the same growth trends as the 'Raminta' variety. Evaluation of the nutrient requirements of perennial ryegrass 'Elena DS' found out that the yield of perennial ryegrass was 15% higher with use of mineral stimulating nitrogen fertilizer rations compared to the yield of perennial ryegrass grown together with red and white clovers.

[1].Ergon, Å., Seddaiu, G., Korhonen, P., Virkajärvi, P., Bellocchi, G., Jørgensen, M., Østrem, L., Reheul, D., Volaire, F. 2018. How can forage production in Nordic and Mediterranean Europe adapt to the challenges and opportunities arising from climate change? *European Journal of Agronomy*, vol. 92, p. 97-106.

[2].Brophy C., Finn J. A., Lüscher A. et al. (2017) Major shifts in species' relative abundance in grassland mixtures alongside positive effects of species diversity in yield: a continental-scale experiment. *Journal of Ecology* vol. 105, p. 1210–1222.