Impact of the agricultural use on the biodiversity of a *Festuca rubra* meadow

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Introduction Technological inputs into meadow ecosystems trigger significant changes in the sward. In this paper we present the effect of organic and mineral fertilisation on the biodiversity of a *Festuca rubra* meadow.

Materials and methods The experimental field was located in the Apuseni Mountains, Romania, at an altitude of 1150 m, an annual rainfall of 1200 mm/year and an annual average temperature of 4° C. Two experiments were carried out where different quantities of organic and mineral fertilisers were applied.

Results Important changes in the pasture vegetation were recorded after a four year period. After the organic and mineral fertilisers are applied, The plant groups in the swards after this period are given in Table 1. Some species increase their cover following fertiliser application (eg. *Trisetum flavescens, Trifolium repens, Trifolium pratense, Vicia cracca, Centaurea pseudophrygia, Pimpinella major, Stellaria graminea*), others decrease (eg. *Festuca rubra, Agrostis capillaris, Luzula campestris, Alchemilla vulgaris, Plantago lanceolata, Plantago media, Potentila erecta, Hypochoeris radicata*), while some disappear when certain quantities of manure are applied (Table 1). Some species increase their proportion by cover (*T. flavescens*, *A. capillaris, T. pratense, V. cracca, C. biennis, P. major, Taraxacum officinale, S. graminea*), some partially lose their share (*F. rubra, Lotus corniculatus, A. vulgaris, C. pseudophrygia, Hypericum maculatum, P. lanceolata, P. media etc),* while other disappear at certain rates (Table 1).

Table 1 Plant cover following four years of application of organic or inorganic fertilisers at different rates

	Control	10 t/ha manure	20 t/ha manure	30 t/ha manure
Poacee (%)	42.9	30.2	21.3	30.7
Fabacee (%)	9.4	29.2	35.2	28.5
OBF (%)	44.3	53.6	51.8	45.1
Species that disapear		*Arabis hirsuta, Leontodon autumnale, Prunella vulgaris, Scabiosa columbaria, Thymus dacicus, Carex pallescens, Gentiana praecox*	*Campanula patula Polygala vulgaris*	*Luzula campestris, Centaurea pseudophrygia, Cerastium glomeratum, Ranunculus bulbosus, Trollius europaeus, Viola declinata*
	control	50N 25P_2O_5 25K_2O	100N 50 P_2O_5 50K_2O	150N 75P_2O_5 75K_2O
Poacee (%)	31.6	19.4	33.0	53.3
Fabacee (%)	6.7	24.9	22.7	9.6
OBF (%)	53.0	51.9	46.8	39.2
Species that disapear		*Carex pallescens, Arnica montana, Campanula patula, Gymnadenia conopsea, Leontodon autumnale, Potentilla erecta, Polygala vulgaris, Prunella vulgaris, Thymus dacicus*	*Arabis hirsuta Centaurea pseudophrygia Leontodon autumnale Scabiosa columbaria Trollius europaeus Carlina acaulis*	*Luzula campestris Plantago media Rhinanthus minor Viola declinata*

OBF-plants from other botanical families (forbs)

Conclusions Agricultural use significantly influences the biodiversity of *Festuca rubra* meadows, determining major changes in the sward by increasing proportion of cover of some species, by reducing the cover of others and by causing the disappearance of some species from the sward.

References

Păcurar F. & I. Rotar, (2004). Maintaining biodiversity and increasing the production of dry matter on mountain meadows. *Grassland Science in Europe*, 9, 216-218.

Rotar, I., F. Păcurar, R. Vidican & N. Sima (2003). Effects of manure/sawdust fertilisation on *Festuca rubra* type meadows at Ghetari (Apuseni Mountains). *Grassland Science in Europe*, 8, 192-194.