

## The effect of different grazing managements on upland grassland

Pavlu<sup>1</sup>, M. Hejman<sup>2</sup>, L. Pavlu<sup>3</sup> and J. Gaisler<sup>1</sup>

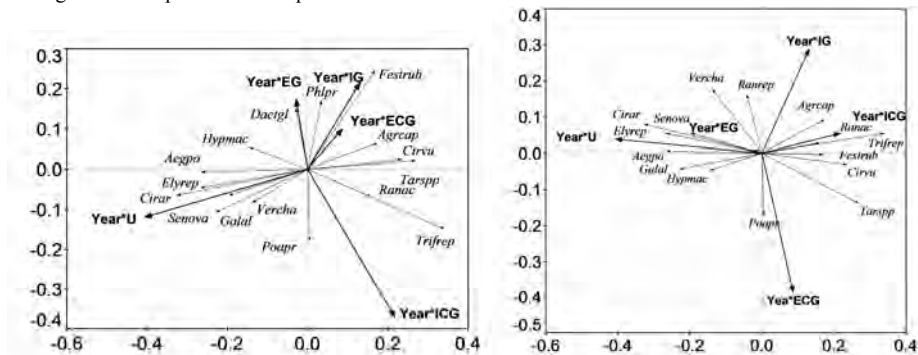
<sup>1</sup>Grassland Research Station, Research Institute of Crop Production, Prague, CZ-460 01 Liberec, Czech Republic, Email:pavlu@vurv.cz; <sup>2</sup>Department of Forage Crops and Grassland Management, Czech University of Agriculture, Kamýcká 957, CZ-165 21 Prague, Czech Republic and <sup>3</sup>Jizerské Mts. Protected Landscape Area Administration, U Jezu, CZ-460 01 Liberec, Czech Republic

**Keywords:** pasture, set stocking, sward, plant species composition

**Introduction** A transformation process in the Czech economy led to a rapid decrease in livestock numbers in the Czech Republic and an enlarged area of grasslands at the beginning of 1990's. The result was extensification of grassland management and also abandonment in marginal areas. The main purpose of this study was to reveal how different managements affect plant species diversity of previously abandoned grassland.

**Materials and methods** An experiment was carried out from 1998 to 2004 in an experimental pasture in the Jizerské hory mountains, Czech Republic. The treatments applied were: intensive grazing (IG), a first cut in June followed by intensive grazing (ICG), extensive grazing (EG), a first cut in June followed by extensive grazing (ECG), and unmanaged grassland (U) as the control were arranged in two complete randomized blocks. The sward was continuously grazed by young heifers to target heights of 5 cm and 10 cm under IG, ICG and EG, ECG treatments, respectively. Percentage cover of all vascular species was measured in permanent 1 m x 1 m plots in four replications in each paddock. Redundancy analysis (RDA) followed by a Monte Carlo permutation test was used to analyze the multivariate data.

**Results and conclusion** Effect of interaction of year and treatment (Figure 1) explained 11.7 % and 17.2 % ( $P < 0.001$ ), whereas successional development independent of experimental treatments explained 13.3 % and 19.4 % ( $P < 0.001$ ) of the variability by the first and all canonical axis, respectively. Tall forbs and tall grasses had higher abundance on treatment U. Species associated with managed treatments were *Agrostis capillaris*, *Taraxacum spp.*, *Trifolium repens* and *Ranunculus repens*. This result indicates a replacing of tall dominants by short grasses, and prostrate forb species.



**Figure 1** Ordination diagram showing the result of RDA analysis a) first and second axis b) first and third axis of plant species composition data. Abbreviations: \*indicates interaction of environmental variables, Aegpo-*Aegopodium podagraria*, Agrcap- *Agrostis capillaris*, Cirar-*Cirsium arvense*, Cirvu-*Cirsium vulgare*, Dactgl-*Dactylis glomerata*, Elyrep-*Elytrigia repens*, Festrub-*Festuca rubra*, Galal-*Galium album*, Hymmac-*Hypericum maculatum*, Phlpr-*Phleum pratense*, Poapr-*Poa pratensis*, Ranac-*Ranunculus acris*, Ranrep-*Ranunculus repens*, Senova-*Senecio ovatus*, Tarspp-*Taraxacum spp.*, Trifrep-*Trifolium repens* and Vecha-*Veronica chamaedrys*.

**Acknowledgement** The study was supported by the Grant Agency of the Czech Republic (no. 526/03/0528).