

Abstract

Semi-natural grasslands of the eastern Moravia have big potential to host species-rich plant communities. However, changes in land-use during the second half of the last century were rapid and vast and many grasslands had been ploughed over. In the early 80s some arable lands were sown with low diversity clover-grass mixture and transferred back to grassland. Restoration of grasslands on former arable fields is a major challenge. Their colonisation by grassland species may be complicated by initial seeding productive low diversity seed mixtures. The aim of this study was to estimate differences in species composition and species diversity between ex-arable artificially seeded grasslands and fragments of grasslands with continuity over 70 years in the north part of White Carpathian Mts., SE Czech Republic and identify species traits limiting species ability to colonize the ex-arable grasslands.

Target plant species (total of 137) were surveyed on 66 grasslands. Surveyed grasslands were according to continuity and type of management.

Coordinates of centroids from each polygon (i. e. surveyed grassland) were used to treat the spatial correlation of the surveyed grasslands. The effect of continuity on species composition and diversity was tested after accounting for differences in the management and abiotic factors (TWI, TPI, DAHI, slope, elevation). Differences in species responses to habitat continuity have been explained by their functional traits (canopy height, zoochory, LDMC, seed mass, SLA and terminal velocity, epizoochory ranking index, and mycorrhizal status). Ecological indicator values were used to distinguish grasslands according to species occurrence and their response to several gradients (pH, moisture, light, temperature, nutrients, salinity).

The results showed that both – management and continuity of grassland significantly affect the species composition. Continuity also affects the species diversity – ex-arable plots turned into grasslands 30 years ago host less species than continual plots. But there was no significant difference of species diversity between mown and grazed plots. Environmental variables that had significant effect on species composition were spatial position, slope and elevation. Spatial position also significantly affected the species diversity, which suggests the need to treat spatial correlation.

Keywords: Carpathian grasslands, species richness, species composition, management, continuity, species traits, grassland restoration, ex-arable land, abiotic factors.