# Abandonment of farming practices: impact on vegetation

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## Introduction

Unprofitability of smal scale of animal production has caused farmers to abandon farming many meadow areas. These areas undergo secondary succession, which in the first phase is manifested by changes in species composition of meadow sward. The aim of the study was to distinguish plant communities which are at most endangered by abandonment of mowing and to assess habitat conditions in uncultivated areas as compared to areas that are still under cultivation.

## Material and methods

The research was conducted in the Beskid Sądecki Mts. (Western Carpathians). Grasslands occupy slopes of various angles and aspects, situated on different altitudes between 400 m a.s.l. and 1000 m a.s.l. 312 sociological relevé were made with Braun-Blanquet method in 2002-2005 on selected 100m$^2$ plots. Species diversity was presented using number of species, Shannon-Wiener diversity index and Simpson's dominance index. We also used an index illustrating the proportion of grasses in relation to other species and calculated Ellenberg indicator values.

## Results and discussion

Farming was mostly abandoned on mat-grass meadows (*Nardetum*) characterized by low productivity and poor nutritive value. The abandonment of mowing was found least frequently for ryegrass meadows (*Arrhenatheretum*) (Tab. 1). Vegetation in unmowed areas was characterized by significantly lower species diversity. Unmowed areas were characterized by lower fertility (N), soil acidity (R) and light (L) Ellenberg indicator values. However, there was no difference in moisture (F) indicator value. Uncultivated areas were found at higher altitudes and where soils had low pH (Tab. 2).

Tab. 1. Proportion of phytosociological relevés [%] made in mown and unmown meadows as a share of all relevés made in each type of plant communities

| | Plant community | | |
|---|---|---|---|
| | Mat-grass meadow *Nardetum* n=48 | Bent-grass meadow *Agrostietum* n=118 | Tall oat-grass meadow *Arrhenatheretum* n=140 |
| Cultivated | 52 | 76 | 84 |
| Uncultivated | 48 | 24 | 16 |
| Total | 100 | 100 | 100 |

Table 2. Species diversity and habitat properties in cultivated and uncultivated areas

| | Cultivated | Uncultivated |
|---|---|---|
| Number of species ** | 37 | 33 |
| Shannon-Wiener index ** | 2.6 | 2.4 |
| Simpson index ** | 9.8 | 8.3 |
| Grass index ** | 1.1 | 1.4 |
| Ellenberg indicator value | | |
| F | 5.2 | 5.2 |
| R ** | 5.4 | 4.9 |
| L ** | 7.1 | 6.9 |
| N ** | 4.7 | 4.1 |
| Altitude [m a.s.l.]* | 640 | 677 |
| pH * | 4.3 | 4.1 |

** P>0.05; ** P>0.01*

Species rich, cultivated meadow

Uncultivated meadow at higher altitudes

## Conclusions

The abandonment of farming practices is especially widespread in meadow communities found in less fertile habitats and at higher altitudes. This particularly concerns mat-grass meadows (*Nardetum*). The abandonment of farming decreases the biological diversity of grasslands.