MEADOWS AND MANAGEMENT ISSUES IN THE CONTEXT OF CURRENT CONCEPT OF LOW-INPUT

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Abstract

The importance of grassland ecosystems exploited in low-input system has been increasingly demonstrated in recent years and changes be they political, economic and / or socially see how it affects not only the ecosystem but the whole agricultural system in the world. There is a clear similarity between the locations where farmland biodiversity has remained relatively stable and where low-input agricultural systems have continued to exist, while the opposite farmland biodiversity decline was the shift to more intensive and efficient agricultural systems. Management type of low-input grassland contributes for basis of decisions on effective environmental management by man, namely its location on the position of "nature partner".

Key words: low-input, management, meadows, biodiversity

At the livestock farm scale, specific and functional diversity of the vegetation depends greatly on how farmers manage grasslands and meadows, and how they are spatially arranged in the landscape (Duru et. al., 2005). Management practices implemented to fulfil different functions in livestock feeding systems generate functional diversity in plant communities between fields within a given farm (Duru et. al., 2005). Extensive grazing and extensive meadow management practices have been typically for subsistence-based or small-scale farming systems in areas of low agriculture productivity.

Administration of large quantities of chemical fertilizers may strongly diminish the plant diversity of semi-natural grasslands [Păcurar et. al., 2012]. So, a growing number of scientists, farmers and public fear for the long term viability of products have made and put in balance external inputs.

Our paper's objective is to study how the management influences the biodiversity in low-input grasslands system.

Table 1

Pairwise comparisons for multiple comparisons (T1,T2-treatments, T – the t test, A – group homogeneity, p – the statistical significance)

Treatments	T	A	p-value	Significance
T1 vs T2	1.35726628	-0.04639493	0.95356399	-
T1 vs. T3	-4.94752587	0.17564317	0.00134676	***
T1 vs. T4	-0.70667165	0.02639186	0.20844893	-
T1 vs. T5	-4.52164814	0.13532349	0.00155657	**
T2 vs T3	-4.75624136	0.18389344	0.00207438	**
T2 vs. T4	-1.00375830	0.04822259	0.14568227	-
T2 vs. T5	-4.54990832	0.15855930	0.00207798	**
T3 vs. T4	-4.80417958	0.23439155	0.00179991	**
T3 vs. T5	1.17084586	-0.04299096	0.89829784	-
T4 vs. T5	-4.66980892	0.18130481	0.00135728	***

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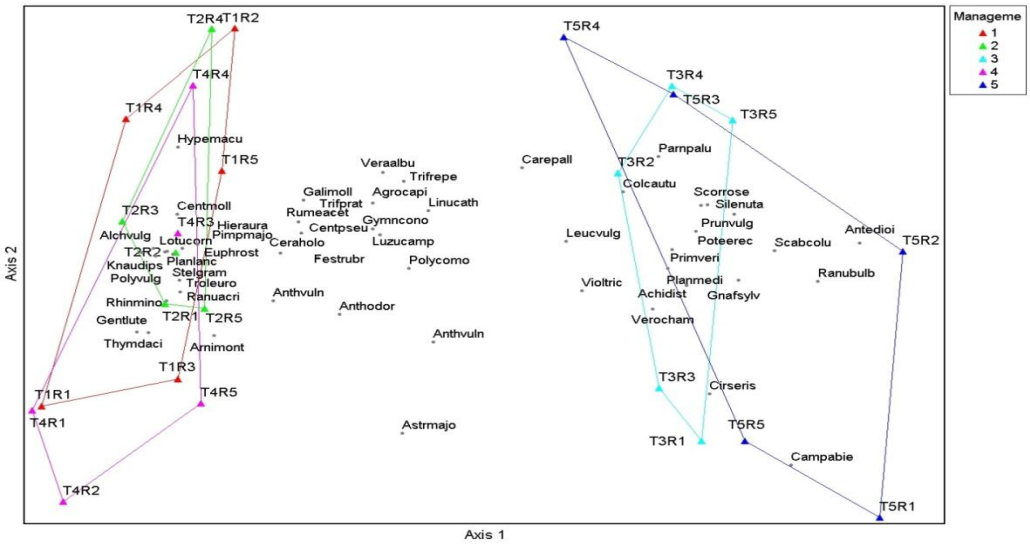

Figure 1 **The floristic composition depending on the ordering of treatments (T-treatments, R-replication)**

MATERIALS AND METHODS

The experimental field is located in the Poienile Ursului, Garda de Sus village, Alba County, Apuseni Mountains at 1380 m elevation and started in 2009, using a randomized block design with five treatments with five replicates.

The plot size is 6 m^2 in the following experimental treatments: T1 - abandoned meadow, T2 - traditional mowing (once per year, at 5-7 cm cutting height, no later than the 1st of August), T3 - early mowing (once per year, at 5-7 cm cutting height, in the first part of June), T4 – (mowing twice per year; at 5-7 cm cutting height, first time in June and the second in August), T5 – imitating grazing through four times mowing per year, in: June, July, August and September, at 5 cm cutting height.

The floristic studies have been performed according to Braun-Blanquet method. For floristic data analysis, we have used the PC-ORD Program which performs multivariate analysis of ecological data (McCune and Grace, 2002).

Our emphasis is on nonparametric tools, graphical representation, randomization tests, and bootstrapped confidence intervals for analysis of community data and MRPP (Multi –response Permutation Procedures, which is a nonparametric procedure for testing the hypothesis of no differences between two or more groups of entities. We have also used non-metric multidimensional scaling (NMS) which is an ordination method that is well suited to data that are non normal or are on arbitrary, discontinuous, or otherwise questionable scales. NMS is generally the best ordination method for community data. A Monte Carlo test of significance is included.

RESULTS AND DISCUSION

In the first two experimental years there are not statistically recorded changes in any of the following experiments. In the second year follow-up Poaceaes have a weight average of 43.71 %, Fabaceaes 7.03 % and plants from other botanical families have the smallest share of 39,41 %. Some species increase their presence and others reduce their presence.

The application of the five types of management after three experimental years has lead to vegetation ordering in two groups of floristic composition.

The first consisting of these types of management: abandonment, traditional mowing and mown twice per year and the second group meets early mowing and grazing imitation (figure 1).

The plant community of the first treatment is not different in floristic composition from the plant community of the traditional mowing and the treatment which is mown twice per year ($p>0.05$) but is different from early mowing and grazing imitation ($p<0.001$; $p<0.01$, table 1).

Compare the witness with treatment which is early mowing we can noticed that is provided very significant ($p<0.001$), the same things being in comparasition between T4 (mowing twice per year) and T5 – imitating grazing through four times mowing per year.

Treatments which are provided distinct significantly are: T1(witness)vs. T5 imitating grazing through four times mowing per year, T2 (traditional mowing) vs T3 (early mowing), T2 (traditional mowing) vs. T5 (imitating grazing through four times mowing per year) and T3 (early mowing) vs. T4 (mowing twice per year)

CONCLUSIONS

A low-input grassland primarily requires extensive management with all their implications (moderate inputs, organic fertilizers, etc.)

Floristic composition varies quite a bit, as determined type *Agrostis capillaris* L. - *Festuca rubra* L. in all three experimental years.

It is obvious that less intensive farms contribute little to overproduction, environmental pollution and loss of biodiversity.

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