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ECOLOGY AND LANDSCAPE MANAGEMENT EXAMINATIONS IN HUNGARIAN GRASSLANDS

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ABSTRACT
Coenological relevés were already prepared in 1997 on the sandy pastures of Hungary which we repeated in 2005 and 2012. The examinations primarily examined that whether any changes happened in vegetation during test period or not.
Our aim was to determine:
- if any changes happened, what kind of direction did these modify the face of the original vegetation.
- how did it influence the combination of species and how they changed the dominance relations in the associations.
Considerable deterioration between the examinations on the areas cannot be experienced under the examined time. Nevertheless, choosing the appropriate treatment and the correct size of grazing livestock, preservation of the natural conditions is possible on both sites.

Keywords: coenological relevés, pasturage, forage value, grass constituent

INTRODUCTION

In Hungary 5.8 million hectares is and approximately 1 million hectares is grassland (HUNGARIAN STATISTIC CENTRAL, 2012). In Hungary 256 674 hectares are under nature protection. In the conservation of thesearea the grazing animal husbandry has a determinative role. It is highly important to harmonise aims and tasks of agriculture and nature conservation in these areas. Overgrazed parts have already been transformed into degraded ruderal areas and grasslands became even poorer in species (ANTAL AND HUZSVAI, 2007). The composition of dominant species in grasslands further away from the summer lodging has not changed significantly. Values of meadows and pastures (natural conservation, lawn farming and forage doctrine) highly depends which is determined by the proportion of useful, less useful and other races. For the accurate knowledge of the species composition of the lawns number of authors justifies the importance of the grazing (SZEMÁN, 2007).

MATERIAL AND METHOD

The examinations were made in three different groups. Intensive grazing area placed (0–50 m) on the other side of fenced area where the fold was built (group A). Grazed area (50–150 m) is grazed by a few animals and this belongs to the second (B) group. Area placed farther than 150 meters belongs to the third (C) group. Coenological investigations were prepared according to BRAUN–BLANQUET (1964) by using 2×2 m quadrates. Among relative ecological values: water demand (WB) and nitrogen demand (NB) values were evaluated according to BORHIDI (2005). Evaluation of social behaviour types were made according to BORHIDI (2005) as well. The natural conservation categories were determined based on Simon's classification. A ten grades scale was created to define the forage value of

the important plant species found in the lawn KLAPP ET AL. (1953). The most valuable species got number 8 the worthless ones which were not grazed by animals got 0 while the poisonous species got -1.

Fodder value of lawns based on the next formula: TÉ= [(a·A+b·B+c·C...)/100] x

TÉ: The fodder value of the lawn.
a, b, c...: The fodder value categories of the species.
A, B, C...: The cover of the species.
x: All of the covers of the species.

RESULTS

The social behaviour types of species

Rate of natural disturbance tolerant (DT) and ruderal competitors (RC) species were high near the farm and observable rate of weeds (W) increased. The natural pioneer (NP) species had roughly identical proportion in all three examination years *(Figure 1)*. Natural competitors (C), generalist (G) and specialist (S) species decreased and they disappeared under thirteen years. The proportion of the ruderal competitors (RC) decreased in the farther areas however, the natural disturbance tolerant species (DT) were in a big proportion on a sign here. The aggressive competitors (AC) species appeared in a no significant rate in the 2005 in the first and the third category *(Figure 2)*. Natural competitors (C), generalist (G) and specialist (S) species in the area 0–50 m and in area 50–150 m spreading category represented a more considerable proportion *(Figure 3)*.

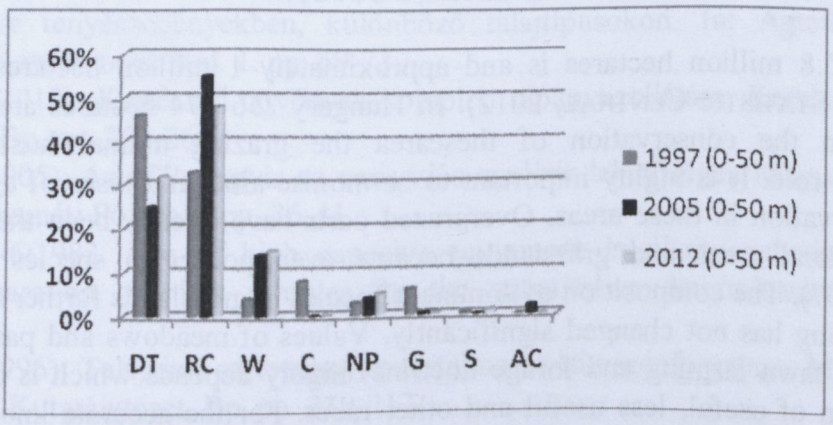


Figure 1. The social behaviour type values between 1997 and 2012 (0–50 m)

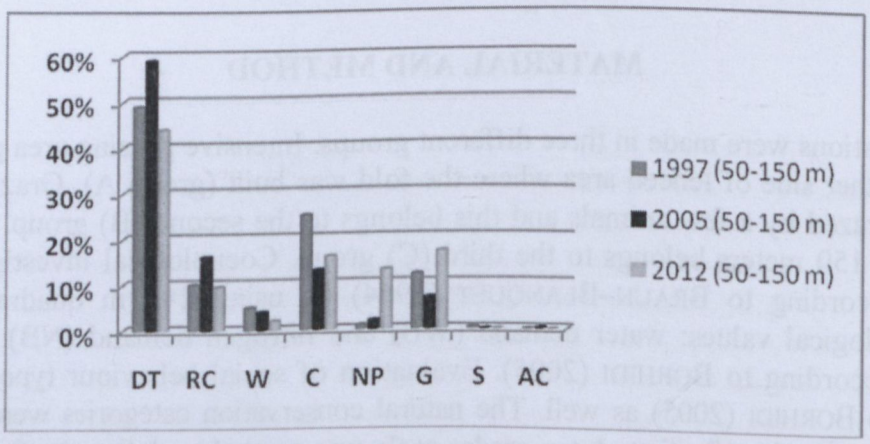


Figure 2. The social behaviour type values between 1997 and 2012 (50–150 m)

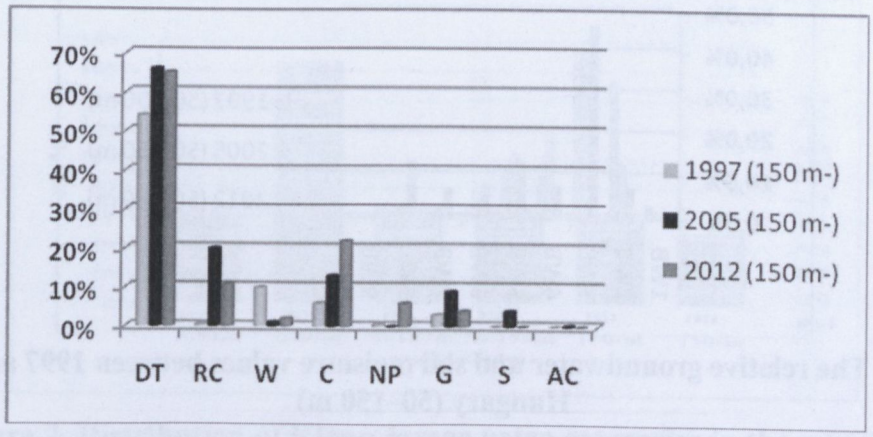


Figure 3. The social behaviour type values between 1997 and 2012 (150 m-)

The relative groundwater and soil moisture

Drought tolerant plant species and plants of occasionally fresh cropland had the highest coverage rate in the area near the farm in all three years. Semi-wet habitats indicator species appeared in an outstanding percentage. It's worthy to mention the rate of typical plants of medium dry places was 7–18%. The dryness tolerant plant species and plants of occasionally fresh cropland were in largest proportion receding from the farm. The number of the dryness tolerant plants in the 50-150 m spreading area category increased significantly and the plants typical of medium dry places and semi-wet habitats indicator species were in an equal quantity *(Figure 4)*. In this category in they were around 10% in 1997 while the moistness attribute plants disappeared till 2010 totally. Plants belong to the third category were in a largest proportion in the areas farthest from the farm *(Figure 5)*. Plants were typical of medium dry places and semi-wet habitats indicator species show an identical fluctuation in all three examination periods *(Figure 6)*.

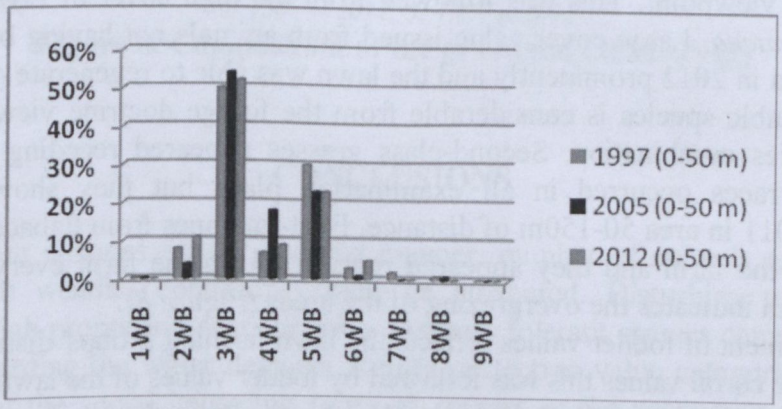


Figure 4. The relative groundwater and soil moisture values between 1997 and 2012 in Hungary (0–50 m)

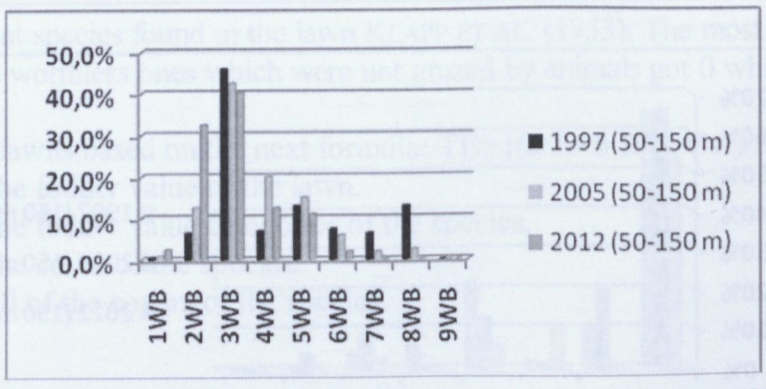


Figure 5. The relative groundwater and soil moisture values between 1997 and 2012 in Hungary (50–150 m)

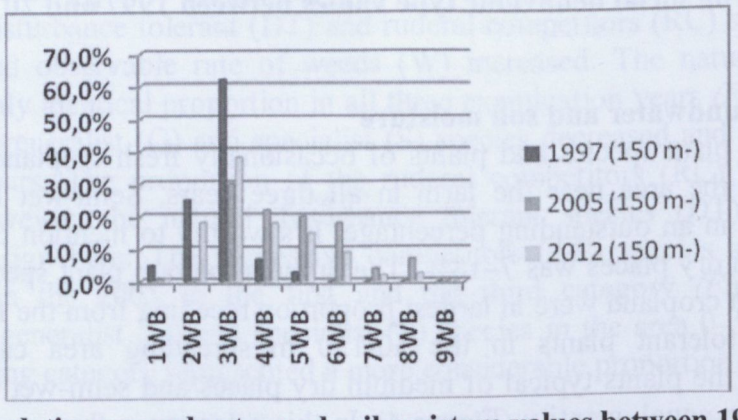


Figure 6. The relative groundwater and soil moisture values between 1997 and 2012 in Hungary (150– m)

Forage values of examined grasslands

Species composition of the lawn near the animal husbandry farm appeared valuable from a forage doctrine viewpoint. This was followed from the high cover of *Elymus repens* and *Festuca arundinacea.* Large cover value issued from animals not having been shepherded out onto the area in 2012 prominently and the lawn was able to regenerate *(Figure 7)*. Rate of the less valuable species is considerable from the forage doctrine viewpoint based on examined species combination. Second-class grasses appeared receding from the fold. Tertiary grass races occurred in all examination place but they showed the largest proportion in 2011 in area 50-150m of distance. First-rate ones from Fabaceae family were missing beside the farm and they appeared receding from the farm everywhere in a big proportion which indicates the overgrazing of the areas *(Figure 8)*.

Klapp establishment of fodder values reflects the lawn farming groups' distribution. Largest values were near corral values this was followed by fodder values of the lawns in the area 50-150 m of distance (*Table 1*) while farther areas had the smallest values.

Table 1. Forage values of examined grasslands in 2011-2012

	Distribution of Klapp forage value of examined grasses					
	2011	2012	2011	2012	2011	2012
Distance (m)	0-50	0-50	50-150	50-150	150-	150-
Value	1.82	6.89	1.58	1.25	0.54	0.78

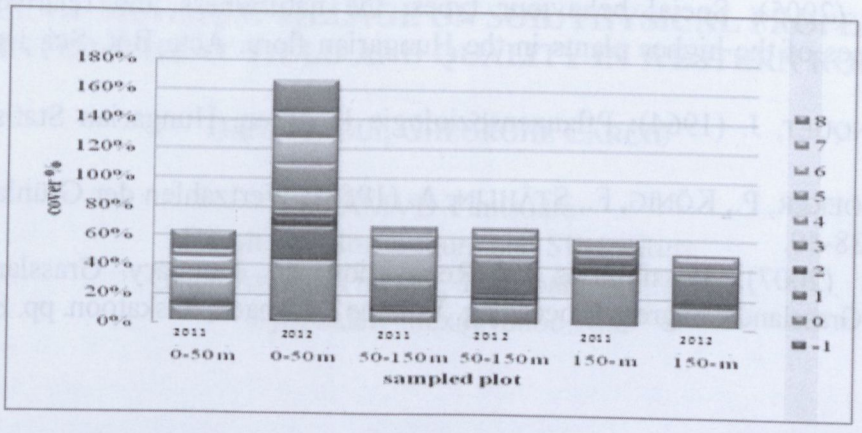
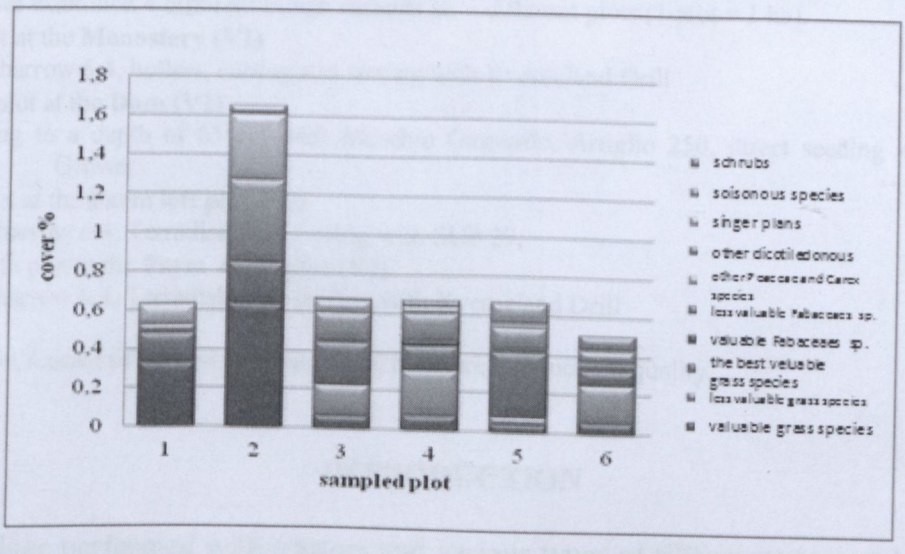


Figure 7. Distribution of Klapp forage value categories in the grassland



Sampled plot and time: 1: 0–50 m 2011; 2: 0–50 m 2012; 3: 50–150 m 2011; 4: 50–150 m 2012; 5: 150– m 2011; 5: 150– m 2012

Figure 8. Composition of the grassland (2011–2012)

CONCLUSIONS

Single protruding changes for the keeping manner, number of animals and in the given year for typical weather conditions could be attributed. Disturbing tolerating weeds appeared in a high proportion near the farm. Dryness tolerant species came forward in the largest rate regarding the water demand. Nature protection value categories followed the establishment of the social behaviour types of species in the proportion of the waitings adequately.

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