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DATA TO THE WEED COMPOSITION OF THE SOUTHERN TRANS-TISZA AREA

ÁKOS BALOGH, ANITA NAGY, MÁRTON VONA, ÁKOS POTTYONDY, EDINA HERCZEG, ÁKOS MALATINSZKY, KÁROLY PENKSZA

Szent István University, Department of Landscape Ecology
H-2103 Gödöllő, Páter Károly u. 1. acoska@freemail.hu

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Abstract: Results are published concerning mainly coenological data on weeds collected from pastures surrounding Biharugra. Evaluation of the coenological surveys was carried out based on those features that represent natural status of pastures quite well, including the coverage features of plants of the region. As a result of the coenological surveys, it can be concluded that natural meadows turn into anthropogenic vegetations gradually, primarily in the neighborhood of resting areas of livestock.

Introduction

Analyzing natural resources such as soil (Gournellos et al. 2004, Centeri 2002, Centeri and Pataki 2005), water (Alvarez-Vázquez et al. 2006) and living organizms (Laguna et al. 2004, Pierpaoli et al. 2003) are equally important in nature conservation. The areas involved in the survey are under nature protection, but they are affected by grazing. This can be considered as a type of management as well as to preserve the traditional landscape of these areas. Agricultural utilization has to be harmonized with environmental protection goals. Nevertheless, during management, some hazards must be taken into consideration (Ángyán et al. 2003). The primarily farming utilization forms are animal grazing and hay meadows to be mowed. In this process it is a significant task that the biomass of pasture and the grass harvested from it should be very good quality. Improper agricultural cultivation (Barczi and Centeri 1999) or over-grazing of meadows might cause a problem. Attention should be paid also to the types of changes, e.g. when some specific weeds are becoming to spread around (*Amaranthus retroflexus, Chenopodium album*) when population of *Cruciferae* weeds is increasing that are able to accumulate nitrate (Mézes 1993). Also hay and the grazed green forage might mean a risk. Excess nitrate intake of pastures involved in the survey was not experienced, but over-grazing can occur at several places. Our surveys focused on these areas. During recent years, utilization of natural meadows for grazing has become more and more common. At the same time, different methods for increasing pasture quality were worked out (Barcsák et al. 1979), but these methods cannot be re-applied on nature protected areas.

Importance of the areas is emphasized by the fact that spots of rare loess vegetation can be found here, preserving endangered plant species being endangered because of nature modifying human activities. In spite of their small sizes, these areas are often considered as treasures, since they preserved the original loess steppe vegetation of the Hungarian Great Plain, and their spots survived can be taken as reminiscent types. The Körös-Maros National Park plays a significant role as preserving the heritage of loess

vegetation. The loess steppe spots can usually be found surrounded by salinizating areas or arable lands under intensive agricultural use. This situation increases their status at risk.

Material and Method

The areas involved in the field survey belong to the Berettyó-vidék, the Körös-vidék, the Békés-Csanádi-hát and the Békés-Csongrádi-sík microregion groups, and within these microregion groups they belong to the Dévaványai-sík, the Kis-Sárrét, the Csanádi and the Békési-hát. Data are published on weed status and spread of species on pastures in the surroundings of Biharugra. Table 1 shows coenological survey data in the neighborhood of an animal breeding farm (0–50 m). Table 2 represents data of salinated areas located 50–150 m far from this farm. Table 3 shows the vegetation of loess steppe grassland that is 250–350 m far from the farm. Records of Table 4 were collected 500–600 m far from the animal breeding farm.

The areas were evaluated based on the figures of water demand (WR) and the nitrogen demand (NB) on the basis of the relative ecological indicators according to Borhidi (Borhidi 1995). Evaluation based on social behavior types was carried out according to Borhidi (1995), while distribution of nature protection values according to Simon (2000). Name of species refer to the nomenclature of Simon (2000).

Results

In the records taken from areas located nearby the animal breeding farm (0–50 m) (Table 1), there can be found only weed species (W) and disturbance tolerant ones (DT), furthermore the *Taraxacum officinale* as ruderal competitor (RC) can be found. The figures represent high relative nitrogen demand (5–8), that is an indicator of high nitrogen load.

Table 1. Coenological records of areas in the surroundings of the animal breeding farm
1. táblázat Az állattartó telephez közeli területek cönológia felvételei

Relevès		*1*	*2*	*3*	*4*	*5*	*SZM*	*NT*
Achillea	collina				5	5	**DT**	**5**
Arctium	lappa					3	**W**	**7**
Capsella	bursa-pastoris	10		3			**W**	**0**
Cichorium	intybus		3				**W**	**8**
Hordeum	murinum	3		5			**W**	**8**
Lolium	perenne	70	80	60	60	75	**DT**	**6**
Taraxacum	officinale		3	5		3	**RC**	**5**
Trifolium	repens					5	**DT**	**6**
Urtica	dioica				5		**DT**	**6**
Poa	humilis				20	15	**–**	**–**

In the records of Table 2, located 50–150 m far from the animal breeding farm, still weeds (W) and disturbance tolerant species (DT) are represented in higher percentage, but there are already generalist (G) and competitor (C) species existing. The relative nitrogen demand of species show a load of (5–8).

Table 2. Coenological records of areas 50–150 m far from the animal breeding farm
2. táblázat Az állattartó teleptől 50–150 m-re lévő területek cönológiai felvételei

Relevès		*1*	*2*	*3*	*4*	*5*	*6*	*SZM*	*NT*
Achillea	collina			2	5	5	3	**DT**	**5**
Capsella	bursa-past.		2					**W**	**7**
Cichorium	intybus	3			2			**W**	**5**
Lolium	perenne	5	25	20	10	10	15	**DT**	**7**
Taraxacum	officinale	5	10	10	10	2	5	**RC**	**7**
Trifolium	repens	2	5	3	3	2	5	**DT**	**7**
Urtica	dioica		2					**DT**	**9**
Cirsium	arvense					2	10	**RC**	**7**
Cynodon	dactylon	25	20	25	60	40	25	**RC**	**5**
Agropyron	repens					3	5	**RC**	**7**
Festuca	pseudovina	10	10	5	5	15	15	**C**	**3**
Gypsophila	muralis	2	2		3			**NP**	**2**
Juncus	compressus			2				**DT**	**5**
Inula	britannica	5	2	3	5		10	**DT**	**5**
Lactuca	saligna					2		**DT**	**5**
Podospermum	canum				2			**G**	**2**
Polygonum	aviculare	6	8	3	5	3	5	**RC**	**5**
Potentilla	argentea					2	3	**DT**	**1**

Table 3 shows loess steppe grassland vegetation of areas located 250–350 m far from the animal breeding farm. The proportion of weeds (W) and disturbance tolerant species (DT) is still high, but the generalist (G) and the competitor (C) species can be found in a higher ratio, and also the number of species has increased significantly.

Table 3. Coenological records of areas located 250–300 m far from the animal breeding farm
3. táblázat Az állattartó teleptől 250–300 m-re lévő területek cönológiai felvételei

Relevès		*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*SZM*	*NT*
Achillea	collina	3	5	3	8	5	3	3	5	3	2	**DT**	**2**
Agrimonia	eupatoria			2		3		2			3	**DT**	**4**
Anagallis	arvensis			2		2						**W**	**6**
Carduus	acanthoides	10	5	15	10	15	5	10	10	15	15	**W**	**8**
Centaurium	uliginosum						1					**G**	**2**
Cirsium	vulgare	3	5	15	10		5	10		5	10	**W**	**8**
Convolvulus	arvensis	2		1	2	2						**RC**	**4**

Contd. Table 3.
3. táblázat folytatása

Relevès		*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*SZM*	*NT*
Crataegus	monogyna		2					5				**G**	**4**
Cynodon	dactylon	5	8	6	5	10	8	5	10	6	5	**RC**	**5**
Daucus	carota			3					5			**DT**	**4**
Eryngium	campestre			3			5			5		**DT**	**2**
Euphorbia	cyparissias	2		3			5		2			**DT**	**3**
Euphorbia	salicifolia				3				2			**DT**	**5**
Festuca	arundinacea								5			**DT**	**4**
Festuca	rupicola	70	60	65	50	45	70	60	65	70	45	**C**	**2**
Galium	verum	2		5	5	5	3	3	5		5	**DT**	**3**
Hypericum	tetrapterum					3				2		**G**	**5**
Medicago	lupulina	2	2	1	2	3		2		2	1	**DT**	**4**
Mentha	longifolia	3	15	25	10	5	5	5	10	5	5	**DT**	**8**
Odontites	vernus			3	3			3				**W**	**4**
Picris	hieracioides			3	2			2			3	**DT**	**4**
Plantago	lanceolata	5	3	3	4	5	5	3	4	2	5	**DT**	**5**
Potentilla	reptans			5		5		3		2		**DT**	**5**
Rubus	caesius	3		2								**DT**	**9**
Salvia	aethiopis		2		5		5	3		5		**DT**	**4**
Thymus	glabrescens	10	15	15	10	15	10	15	5	10	15	**G**	**1**
Verbena	officinalis			3		5	5	3	2	5		**W**	**6**

In the records of Table 4, taken 500–600 m far from the animal breeding farm, there are still weed species to be found, but the ratio of generalist (G) and the competitor (C) species refers to the area being closer to natural environment. Protected species can be found on the wetter and at the same time more saline area such as *Iris spuria.* While on higher located, deteriorated loess steppes one of their rarest species, a huge population of *Cirsium furiens* was found.

Table 4. Records of areas located 500–600 m far from the animal breeding farm
4. táblázat Az állattartó teleptől 500–600 m-re lévő területek felvételei

Relevès		*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*ZSM*	*TN*
Achillea	collina			5	5	6	5	5	5	2	3	**DT**	**2**
Agrimonia	eupatoria			5	2	3	2	2	2			**DT**	**4**
Agropyron	repens	5	10	5	5	5	5	5	5	5	8	**RC**	**7**
Agrostis	stolonifera					2	3	10	2	2	2	**C**	**5**
Anagallis	arvensis			2								**W**	**6**
Carduus	acanthoides		5	5							25	**W**	**8**

Carex	hirta			2	1		3	2	2			**DT**	**5**
Centaurea	pannonica			5	2	3	5					**DT**	**4**
Cirsium	arvense	3										**RC**	**7**
Cirsium	furiens				10	20	25	10	5	5	10	**W**	**7**
Cirsium	vulgare			5			2					**W**	**8**
Coronilla	varia						2					**DT**	**3**
Cynodon	dactylon	5	5	5	5	3		3		5		**RC**	**5**
Dipsacus	laciniatus								2			**W**	**5**
Epilobium	tetragonum	2	2									**G**	**5**
Eryngium	campestre				5	2	2	2				**DT**	**2**
Euphorbia	cyparissias			2	2	2		2	2		2	**DT**	**3**
Euphorbia	salicifolia		2	5	3	2	2		2			**DT**	**5**
Festuca	arundinacea				5			3	5			**DT**	**4**
Festuca	rupicola	45	35	30	35	40	35	30	35	35	40	**C**	**2**
Filipendula	ulmaria		15		5	3	5	5	8	5	10	**G**	**4**
Fragaria	viridis	25		10	5	3						**G**	**3**
Galium	verum	10	10	5	10	8	10	8	5	3	5	**DT**	**3**
Hypericum	perforatum		2	2	2		2	2				**DT**	**3**
Iris	spuria	10	2									**Sr**	**3**
Knautia	arvensis			5	3		5	5	3			**DT**	**3**
Lathyrus	tuberosus		2	2	2	3	3	2	2	1		**W**	**4**
Limonium	gmelini	3	1									**S**	**5**
Linaria	vulgaris				2	2			1			**W**	**3**
Lithospermum	officinale							3				**DT**	**6**
Lotus	tenuis			2	3	2						**DT**	**4**
Medicago	falcata			2								**DT**	**3**
Melandrium	viscosum		2									**S**	**2**
Mentha	longifolia				2			10	5			**DT**	**8**
Odontites	vernus			2	15	20		3	5			**W**	**4**
Ononis	spinosa				20	3		5				**DT**	**3**
Ornithogalum	pyramidale									3	3	**DT**	**5**
Peucedanum	alsaticum						5					**G**	**2**
Picris	hieracioides			2	2	1	2	2	1		2	**DT**	**4**
Pimpinella	saxifraga				2	5	3	2	3			**G**	**2**
Plantago	lanceolata			5	2	3		2	3		2	**DT**	**5**
Plantago	media					2						**DT**	**3**
Poa	angustifolia	5	10	10	10	10	10	10	10	10	10	**DT**	**3**
Potentilla	argentea									3		**DT**	**1**
Prunus	spinosa			2			5					**C**	**2**
Ranunculus	polyanthemos			5	3	2	3	2	3			**G**	**4**
Rubus	caesius					2	2					**DT**	**9**
Salvia	pratensis			2	10	5	3	5	8	3		**G**	**4**
Senecio	integrifolius			5	2		2					**G**	**4**
Serratula	tinctoria				5		2					**G**	**5**
Seseli	annuum								2		2	**G**	**2**
Stachys	annua				1							**W**	**4**

Contd. Table 4.
4. táblázat folytatása

Relevès		*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*ZSM*	*TN*
Thalictrum	minus				2							**G**	**3**
Thesium	arvense			2	2							**G**	**1**
Thymus	glabrescens			25	20	15	15	25	15	15	15	**G**	**1**
Torilis	arvensis			2								**W**	**4**
Trifolium	repens						2					**DT**	**7**
Verbascum	blattaria									2	5	**DT**	**6**
Verbena	officinalis			2			2					**W**	**6**
Veronica	orchidea	1	2							3		**G**	**3**

On the area involved in the study it is the surroundings of the stable that represents mostly anthropogenic vegetation type based on the distribution due to relative water demand. As the distance is increasing away from the stable, based on the relative nitrogen demand, the low nitrogen demanding vegetation will become more and more characteristic (Figure 1).

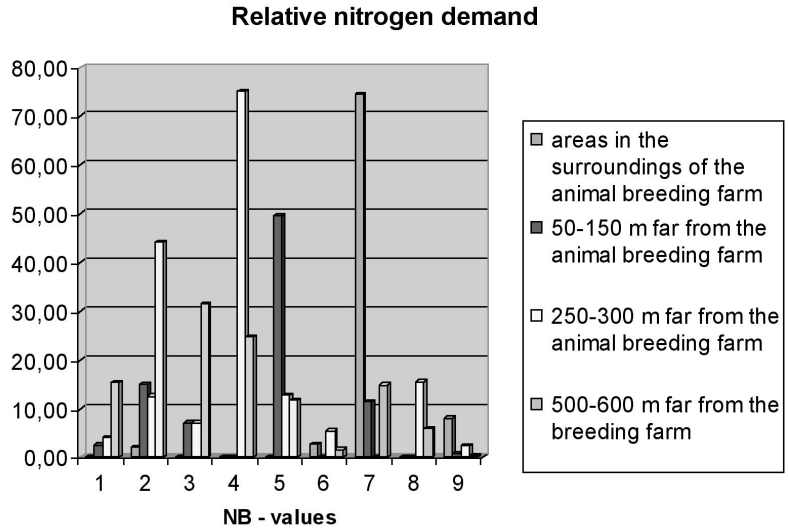

Figure 1. Distribution based on relative nitrogen demand in relation with the distance increasing from the stable
1. ábra A relatív nitrogén igény szerinti megoszlás az istállótól távolodva

The species show higher relative water demand in parallel with higher nitrogen demand in the areas located close to the stable.

Based on the distribution of social behavior of species, the disturbance tolerant and weed species are the dominant ones in the records taken in the areas surrounding the stable. The situation is similar on saline areas nearby the stable, but in a smaller extent. Ratio of natural species is gradually increasing as approaching farther areas. In the records taken 300–400 m far from the farm there is a favorable species composition even

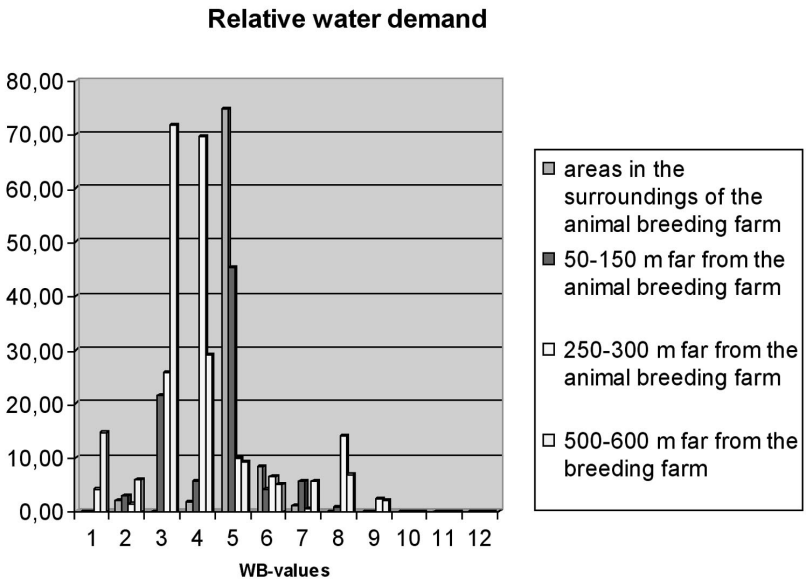

Figure 2. Distribution based on relative water demand
in relation to distance increasing from the stable
2. ábra A relatív vízigény szerinti megoszlás az istállótól távolodva

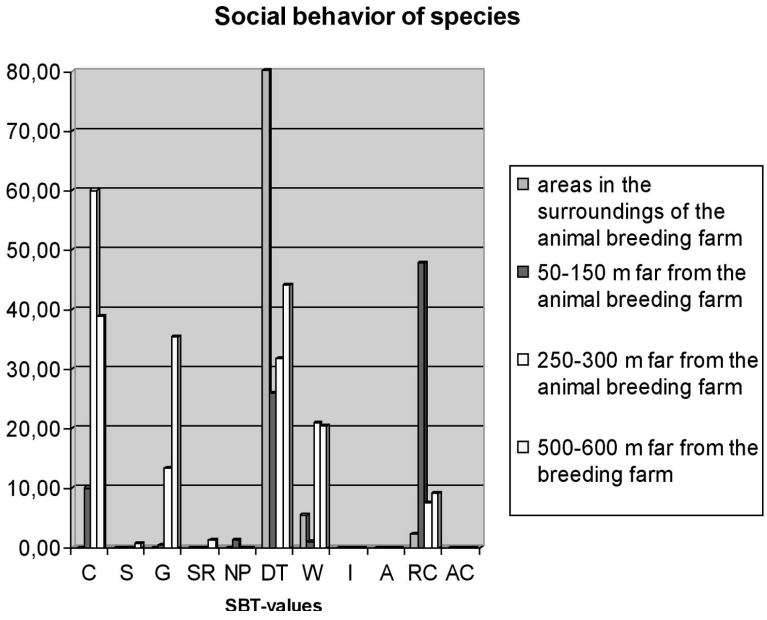

Figure 3. Distribution based on social behavior of species
in relation to distance increasing from the stable
3. ábra A relatív vízigény szerinti megoszlás az istállótól távolodva

from environmental point of view. Based on these findings, grazing in this distance, temporarily and not over-stressing the area, will properly control the species composition.

Table 5. Laboratory data of examined soils under grazed and mown areas
5. táblázat A mintaterületek laboratóriumi talajtani adatai

Sampling place from the animal breeding farm	*pH KCl*	*pH H_2O*	*Humus*	*Sum N mg/kg*	*P_2O_5*	*K_2O*	*Ca*	*NH_4-N mg/kg*	*NO_3-N mg/kg*
0–50 m									
0–20 cm	7,27	7,71	5,01	*2534*	*2028*	*1011*	1,16	6,86	6,86
0–50 m									
20–40 cm	7,45	8,98	1,78	*1735*	*1556*	*1077*	1,42	< KH	6,86
Saline place									
0–50 m									
0–20 cm	6,73	7,73	5,55	*3644*	168	247	0,129	< KH	3,43
Saline place									
0–50 m									
20–40 cm	7,53	8,69	2,51	2057	54,6	220	0,456	20,6	3,43
50–150 m									
0–20 cm	5,95	6,63	2,27	2096	21,0	146	0,229	6,86	3,43
50–150 m									
20–40 cm	6,23	6,98	1,89	1635	15,9	127	0,236	< KH	3,43
250–300 m									
0–20 cm	7,63	8,6	1,65	1905	38,7	294	1,35	6,86	3,43
250–300 m									
20–40 cm	7,68	8,75	0,85	1097	22,1	270	1,16	< KH	3,43
500–600 m									
0–20 cm	6,32	6,83	5,57	3546	23,9	160	0,371	10,3	3,43
500–600 m									
20–40 cm	6,93	7,62	2,60	2175	16,7	122	0,393	6,86	3,43

During pedological surveys it was proven that the nitrogen, P_2O_5 and K_2O figures are relatively high both in the upper soil layer (0–20 cm) and in the lower soil layer (20–40 cm) in the proximity of animal breeding farms (Table 5). The nitrogen figures were still high further from the animal breeding farm at the distance of about 100 m, and it was indicated also by disturbance tolerant plants. Even further (at 200–300 m distance) the botanical composition was similar to that of natural meadows that is valuable from nature protection point of view. This was also verified by soil data that, as a result of periodic grazing, nutrient exploitation is not experienced. According to the results of our experiment it is obvious that considering the vegetation on these areas, applying not intensive grazing at the distance of 200–300 m from animal breeding farms seem to be a useful and advised treatment.

As a conclusion it can be stated that the effect of intensive animal grazing resulted in a significant change of plant species in the surroundings of the stable, part of the most characteristic species has disappeared and they were replaced by disturbance tolerant

species or toxic and weed species. *Lolium perenne* has become the most significant species. This is a disadvantageous change: both considering environmental and farming values. Species composition of the pasture becomes different and changes towards ruderal associations. Regeneration possibility of the pasture is minimal, therefore animal grazing must be controlled and decreased.

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ADATOK DÉL-TISZÁNTÚLI VÉDETT TERÜLETEK GYOMVISZONYAIHOZ

BALOGH ÁKOS, NAGY ANITA, VONA MÁRTON, POTTYONDY ÁKOS,
HERCZEG EDINA, MALATINSZKY ÁKOS, KÁROLY PENKSZA

Szent István Egyetem, Tájökológiai Tanszék
2103 Gödöllő Páter K. u. 1. acoska@freemail.hu

Kulcsszavak: legeltetés, kaszálás, cönológiai felmérés

Összefoglalás: Jelen közleményben Biharugra környéki legelőkről és kaszálókról közlünk cönológiai adatok alapján eredményeket, kiemelve a gyomfajokat. A cönológia felvételeket – a megtalálható növényfajok borítási értékeit is figyelembe véve – olyan mutatók alapján is értékeltük, melyek a gyepek természetességi állapotának jó jelzői. A cönológiai vizsgálat alapján kiderült, hogy a természetes gyepek folyamatosan alakulnak át antropogén vegetációkká, elsősorban az állatok szálláshelyének közelében. A talajtani vizsgálatok igazolják, hogy az állattartó telephez közel mind a feltalajban (0–20 cm), mind az altalajban (20–40 cm) magas nitrogén, P_2O_5, K_2O értékek jelentkeztek. Az állattartó teleptől távolodva 100 m-re szintén magas nitrogén értékekkel találkoztunk, amit a zavarás tűrő fajok is jeleztek. Távolabb (200–300 m) a botanikai összetétel a természetes gyepekhez közelálló, természetvédelmi szempontból értékes, ezt a talajtani adatok is megerősítik, az időszakos legeltetés eredményeképpen a tápanyagterhelés nem jelentkezik koncentráltan. A vegetáció szempontjából az állattartó telepektől 200–300 m távolságban és távolabb történő legeltetés hasznos, megfelelő kezelésként alkalmazható.