RESEARCH ON THE EFFECT OF OVERPADDOCKING GRASSLANDS ON ALTITUDE SITUATED ON BASIC ROCKS

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Abstract. *In Transilvania Plateau, Brașov Depression and Bârsa Mountains on the basic lithogenic soil are grasslands with, very high pastoral value dominated by Festuca rupicola, Poa pratensis, Cynosurus cristatus, Agrostis capillaris, Festuca rubra, Trifolium repens and other forage species. By overpaddocking during the 6-8 nights, 1 sheep/1 sqm, these grasslands are invaded by nitrophile weeds such as Rumex obtusifolius between 300-1,200 m altitude, Rumex alpinus over 1,200 m to 1,600-1,800 m altitude and Urtica dioica in the all zones. In the soil the fertilizer nutrients are accumulated excessively potassium and nitrogen. In function of the overpaddocking intensity, the noxious effect during the 4 (6) - 8 (12) years. In this period the soil is invaded by weeds, being out economic cycle.*

Keywords: overpaddokig, botanical composition, agrichemical content

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1. Introduction

The Romanian pastoral landscape is seriously disturbed by the appearance and expansion of nitrophilous vegetation (sedges, nettles, sedges, crocus, tarsus, etc.), the result of animals staying in pens (pen, pens) on pastures over the night or day, beyond normal limits, in order to be more easily guarded and protected against predators (wolves, bears, lynxes, etc.) or to be milked during the day [2].AAS

In addition to the aesthetic discomfort that goes almost unnoticed by the average citizen, over-fertilization accumulates a large amount of solid and liquid manure that pollutes groundwater and surface water, produces olfactory pollution through the pestilential miasmas they emanate, and over-fertilizes the soil with fertilizing elements that then facilitate the establishment, to the point of dominance, of specific weeds that are not consumed by animals [3].

This causes large areas of valuable grasslands to be removed from the direct productive circuit. Overgrazed areas are good hosts for the establishment of diseases and pests in animals and even humans. Overgrazing in some areas on slopes causes soil erosion [1].

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We propose to present some of these aspects, less studied in our country, in the following.

2. Materials and methods

Four grasslands located at different altitudes were studied, namely the Hetiur-MS locality (300 m altitude) in the Transylvanian Plateau on Sarmatian limestone deposits, Măgurele near Brașov (600 m altitude) in Bârsa Region on a dejection cone with calcareous lithological materials, Poiana Brașov (900 m altitude) and the Postăvarul Massif (1,600m altitude) on limestones and conglomerates in the Bârsei Mountains.

In each of these stations, the studies were carried out in parallel on a pasture with ordinary vegetation and in proximity on an overfed surface after the stationing of sheep with nitrophilous vegetation, specific to the moorlands.

Floristic surveys were prepared according to the method of percentage assessment of participation in the aboveground phytomass (KLAPP-ELEMBERG) and soil samples were taken with an agrochemical probe from 35-40 places for one sample, at depths of 0-10 and 10-20 cm, for laboratory analyses according to the current models used in the Offices of Studies for Pedology and Agrochemistry developed by National Research and Development Institute for Pedology and Agrochemistry-Bucharest.

3. Results and discussions

The excess of fertilizing elements on grasslands overpaddocking by sheep produced a radical change in the grassy carpet, in a negative sense (Table 1).

Table 1. Floristic composition of natural ungrazed and overpaddocking pastures located on limestone rocks

Conditions	**No paddocking (N)**					**Overpaddocking (O)**					**Diff**
Station	1	2	3	4	Media	1	2	3	4	Media	**(O-N)**
GRASSES	**70**	**80**	**95**	**75**	**80**	**5**	**5**	**3**	**1**	**4**	**-76**
Agrostis capillaris	10	35	70	10		-	-	-	-		-
Cynosurus cristatus	5	20	+	+		-	-	-	-		-
Festuca rupicola	30	-	-	-		-	-	-	-		-
Festuca rubra	-	15	20	60		-	-	-	-		-
Nardus stricta	-	-	2	-		-	-	-	-		-
Poa pratensis	15	10	2	2		-	-	-	-		-
Alte graminee	10	+	1	3		5	5	3	1		-
LEGUMES	**15**	**15**	**2**	**5**	**9**	**+**	**+**	**5**	**4**	**2**	**-7**
Lotus corniculatus	5	2	+	+		-	-	-	-		-
Trifolium repens	5	13	2	3		+	+	5	2		-
Others legumes	5	+	+	2		-	-	+	2		-

OTHERS FAMILIES	**15**	**5**	**3**	**20**	**11**	**95**	**95**	**92**	**95**	**94**	**+83**
Achillea millefolium	1	1	2	+		-	-	-	-		-
Alchemilla vulgaris	-	-	+	15		-	-	+	+		-
Anthemis cotula	-	-	-	-		5	10	-	-		-
Arctium lapppa	-	-	-	-		3	2	-	-		-
Rumex alpinus	-	-	-	-		-	-	-	70		-
Rumex obtusifolius	-	-	-	-		60	70	20	-		-
Stachys germanica	8	-	-	-		-	-	-	-		-
Urtica dioica	-	-	-	-		25	8	70	20		-
Others	6	4	1	5		2	5	2	5		-

Locations: 1- Hetiur MS (300 m alt.); 2- Măgurele BV (600 m alt.)
3- Poiana BV (900 m alt.); 4- Postăvar BV (1,600 m alt.)

Thus, instead of very valuable grasslands types dominated by *Festuca rupicola* + *Poa pratensis* + *Agrostis capillaris* (Hetiur), A*grostis capillaris* + *Cynosurus cristatus* + *Trifolium repens* (Măgurele), *Agrostis capillaris* + *Festuca rubra* (Poiana) and *Festuca rubra* (Postăvar), after about 2 years of over-threshing, nitrophilous weeds such as *Rumex obtusifolius* with *Urtica dioica* up to about 1,200 m and *Rumex alpinus* with *Urtica dioica* at higher altitudes up to 1,600 m altitude appeared en masse.

Weedy areas are avoided by animals and only after several years until the excess fertilizer elements are exhausted, after about 4 (6) – 8 (12) years, more valuable forage species consumed by animals begin to settle. Major changes also occur in the chemical composition of over-cultivated soils (Table 2).

Thus, solid manure from sheep increases the pH index by 0.33 units and the degree of base saturation by 11.65% at a depth of 0-20 cm.

On the other hand, the humus content is slightly decreasing due to the intensification of mineralization processes as a result of stimulating the activity of soil microorganisms.

Similarly, the content of mobile phosphorus in the soil increases within reasonable limits without being in excess.

The potassium content of over-fertilized soils is very high and the nitrogen index is very high, respectively the two fertilizing elements N and K are in excess and generate soil and water pollution, favoring the establishment of the specific over-fertilized weeds mentioned above.

Regarding the distribution of agrochemical characteristics of soils at depths of 0-10 cm and 10-20 cm, a normal increase in the pH index by 0.1 at depths of 10-20 cm compared to 0-10 cm is observed due to the substrate with a basic reaction.

In the same interval, humus and fertilizer elements are in a slight decrease.

Table 2.. The main agrochemical properties of soils on no-paddocking and overpaddocking grasslands

Nr. crt.	Station	No-paddoking (N)			Overpadoking (O)			Diff. (O-N) 0-20 cm
		0-10 cm	10-20 cm	MEDIA 0-20 cm	0-10 cm	10-20 cm	MEDIA 0-20 cm	
Soil acidity (pH in H_2O)								
1	Hetiur-MS	7.9	8.0	7.95	7.9	8.0	7.95	0.0
2	Măgurele-BV	5.6	6.0	5.80	7.0	6.9	6.95	+1.15
3	Poiana-BV	5.3	5.1	5.20	5.6	5.4	5.50	+0.30
4	Postăvar-BV	7.4	7.5	7.45	7.2	7.4	7.30	-0.15
	AVERAGE	**6.55**	**6.65**	**6.60**	**6.93**	**6.93**	**6.93**	**+0.33**
	Diff. adc. +; -	**-**	**+0.10**	**-**	**-**	**0.0**	**-**	**-**
Saturation degree in bases (V Ah %)								
1	Hetiur-MS	100.0	100.0	100.0	100.0	100.0	100.0	0.0
2	Măgurele-BV	73.1	81.6	77.35	100.0	93.2	96.6	+19.25
3	Poiana-BV	24.6	21.5	23.05	57.0	43.8	50.40	+27.35
4	Postăvar-BV	100.0	100.0	100.0	100.0	100.0	100.0	0.0
	AVERAGE	**74.43**	**75.80**	**75.10**	**89.25**	**84.25**	**86.75**	**+11.65**
	Diff. adc. +; -	**-**	**+1.37**	**-**	**-**	**-5.0**	**-**	**-**
Humus %								
1	Hetiur-MS	5.79	3.72	4.76	5.24	4.69	4.97	+0.21
2	Măgurele-BV	7.38	4.94	6.16	8.11	4.14	6.13	-0.03
3	Poiana-BV	9.72	7.38	8.55	10.38	9.72	10.05	+1.50
4	Postăvar-BV	19.08	18.12	18.60	12.30	7.44	9.87	-8.73
	AVERAGE	**10.49**	**8.54**	**9.52**	**9.00**	**6.50**	**7.75**	**-1.77**
	Diff. adc. +; -	**-**	**-1.95**	**-**	**-**	**-2.50**	**-**	**-**
Mobile phosphorus P-Al (ppm)								
1	Hetiur-MS	56.0	12.2	34.10	34.0	37.0	35.50	+1.40
2	Măgurele-BV	5.5	5.5	5.50	32.5	31.5	32.00	+26.5
3	Poiana-BV	19.8	15.2	17.50	73.5	31.5	52.50	+35.00
4	Postăvar-BV	23.5	14.2	18.85	112.0	98.0	105.00	+86.15
	AVERAGE	**26.20**	**11.78**	**18.99**	**63.00**	**49.50**	**56.25**	**+37.26**
	Diff. adc. +; -	**-**	**-14.42**	**-**	**-**	**-13.50**	**-**	**-**
Mobile potassium K-Al (ppm)								
1	Hetiur-MS	400	249	325	430	450	440	+115
2	Măgurele-BV	131	76	104	410	425	418	+314
3	Poiana-BV	114	104	109	264	264	264	+155
4	Postăvar-BV	171	104	138	400	360	380	+242
	AVERAGE	**204**	**133**	**169**	**376**	**375**	**376**	**+207**
	Diff. adc. +; -	**-**	**71**	**-**	**-**	**-1**	**-**	**-**

Conclusions

(1). The grasslands overpaddocking produces serious imbalances in the environment through their polluting effect on water, soil, valuable forage grass vegetation and, last but not least, the landscape;

(2). The more valuable types of grasslands formed by *Festuca rupicola, Agrostis capilllaris, Poa pratensis, Festuca rubr*a and other good forage species on soils with basic lithological substrate after the accumulation of excess manure, for several years in a row are dominated by nitrophilous weeds such as *Rumex obtusifolius* up to about 1,200 m altitude, *Rumex alpinus* up to 1,600-1,800 m and *Urtica dioica* from the hill area to the high mountains;

(3). The soils in overpaddocking pastures have a very high content of potassium and nitrogen, which in excess pollute, are balanced in phosphorus, with an average increase in the pH index of 0.33 units, from 6.60 to 6.93 and in the degree of saturation in bases of 75.10% to 86.75% on average at a depth of 0-20 cm compared to non-paddocking lands, characteristics that are not harmful to valuable forage grasses;

(4). The most effective measures for removing nitrophilous weeds are preventive ones, following the rules of rational grazing, which on pastures with valuable grass cover should not exceed 2-4 nights, 1 sheep/1 sq m or 1 cow/6 sq m;

(5). By exceeding these duration limits beyond 6-8 nights, overpaddocking occurs with its negative consequences.

R E F E R E N C E S

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