

## **STUDY ON THE PASTORAL VALUE OF *AGROSTIS CAPILLARIS* GRASSLAND ON TĂȘAD HILLS (BIHOR COUNTY)**

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### **Abstract**

*This paper is a study of the pastoral value of Agrostis capillaris grassland in the area of Tășad Hills, Bihor County. The study was carried out in order to optimize the use of grassland, to determine the correct biomass production and load with animals.*

*The determination of the pastoral value of grassland in the area of Tășad Hills is important in the context of rural development, the preservation of biodiversity, the improvement of soil fertility and the provision of quality feed for animals.*

*The study of the pastoral value of the Agrostis capillaris grasslands was carried out between 2018 and 2019, with a number of 28 relevées being carried out. The pastoral value was determined individually for all the relevées, and finally an average pastoral value of the studied grassland was also determined.*

*The determination of the pastoral value of grassland at national level is useful in the context of carrying out pastoral planning, which are useful in the context of the increase in eligible grassland areas and the economic activities of livestock farming.*

**Key words:** pastoral value, grasslands, optimization, qualitative index, species.

### **INTRODUCTION**

Grassland is an essential element of sustainable farming systems that meet the demands of healthy and high-quality food.

In addition to the decisive role of providing animal feed, grassland has an important function in rural development and the environment, reflected by the preservation of biodiversity, improvement of soil fertility, nitrogen symbionts, hydrologic balance, flood and landslides prevention, atmospheric carbon storage, landscape quality and important cultural heritage.

Livestock systems based on the exploitation of grazing land are now facing growing food needs, as the production of feed produced on these areas keeps pace with the growing demands of meat, milk and climate change.

Recent publications on the study of grassland quality in Romania were carried out by Durău, Moisuc, 2006; Durău et al., 2008; Marușca, 1978, 2005, 2008, 2013; Moisuc et al. 2001; Pășcuț, 2017, 2018; Păcurar, Rotar, 2014.

## MATERIAL AND METHOD

For the determination of the pastoral value of the studied grassland, floristic methods of appreciation have been used. The assessment of the participation of the component species and the floristic composition was made in combination with the phytosociological method and the pratological method. The phytosociological method makes use of an appreciation of the abundance and dominance (AD) of species on relevées of 100 m<sup>2</sup> at key representative points and is marked on a 6-step scale, namely: 5 (coverage average of 87.5%), 4 (coverage average of 62.5%), 3 (coverage average of 37.5%), 2 (coverage average of 17.5%), 1 (coverage average of 5%), + (coverage average of 0.5%), (Ivan, Doniță, 1975; Cristea et al., 2004). The pratological method consists in assessing the percentage participation of botanical components in biomass by economic groups: *Poaceae*, *Fabaceae*, other families, harmful-toxic species, wood species, and is the one used more widely in the study carried out.

The relevées were chosen in the characteristic fragments of the meadows depending on the nature and complexity of their horizontal and vertical structure.

To describe the vegetation as accurately as possible data were recorded on the habitat conditions under which this grassland is developed, namely: altitude, GPS coordinates, exposition, slope tilt, vegetation cover (%). Quantitative participation of each species was also recorded by setting the dominance and percentage (Table 1).

For the determination of the pastoral value the following formula was used as indicated by certain specialists, (Marușca et al., 2014):

$$V.P. = \sum PC(\%) \times IC / 5$$

where: V.P. – pastoral value indicator (0-100);

P.C. – participation in the grassy area (%),

I.C. – forage quality index.

The values of the feed quality index (IC) have been taken over from the work of Rotar et al. (2009) și Marușca et al. (2012, 2014).

After the relevées had been carried out on the field and the percentage share of each species's participation in the floristic composition had been determined, the feed quality index was passed, with values from 0 (without fodder value) to 5 (with excellent fodder value). After determining the pastoral value indicator, grasslands can be appreciated as follows: 0-5 (degraded grassland), 5-15 (very weak), 15-25 (weak), 25-50 (medium), 50-75 (good), 75-100 (very good) (Marușca et al., 2014).

The scientific name of the species identified on the ground was adopted in accordance with the expert work developed by Ciocârlan (2009) and Sârbu et al., 2013.

## RESULTS AND DISCUSSION

The grassland of *Agrostis capillaris* occupy the largest surface in the Tășad Hills area. This grassland is found on lands with different expositions, with slope of 6.87-20.57%, at altitudes between 200 m and 440 m. The vegetation of this grassland is mainly occupied by grass species (58-97%), there also being some woody species, especially shrubs (3-42%). The floristic composition of this grassland is rich in species (161 species) (Table 1). The grassy vegetation is largely composed of *Poaceae* species (69.11%, 25 species), where the dominant is *Agrostis capillaris* (54.29%), other species being presentes well such as *Lolium perenne* (3.68%), *Festuca rubra* (2.46%), *Dichanthium ischaemum* (2.32%), *Holcus lanatus* (1.11%), *Festuca pratensis* (0.89%), *Cynosurus cristatus* (0.79%), *Festuca valesiaca* (0.75%), *Festuca rupicola* (0.64%), *Cynodon dactylon* (0.5%), *Poa pratensis* (0.5), *Anthoxanthum odoratum* (0.5%). There are also *Fabaceae* species (5.39%, 13 species), of which the most common are *Trifolium repens* (2.14%), *Lotus corniculatus* (1.61%), *Trifolium campestre* (0,53%), *Trifolium pratense* (0,5%). The numerical weight is held by the species from other families of herbaceous plants (88 species), these having an overall coverage of 8.11%, the following species being highlighted *Thymus glabrescens* (1.68%), *Juncus effusus* (1.14%), *Hieracium pilosella* (1%), *Daucus carota* (0.75%), *Leontodon hispidus* (0.57%). Toxic and harmful species have a weight of 17.4% (18 species), of which we can highlight *Euphorbia cyparissias* (9.21%), *Pteridium aquilinum* (5.82%), *Eryngium campestre* (1.61%) (Table 1).

The woody vegetation has a significant share in some grassland, occupying 16.8% (17 species) in the studied relevées. From the shrubs the following stand out *Rubus sulcatus* (7.29%), *Prunus spinosa* (2.04), *Crataegus monogyna* (1.21%), *Rosa canina* (1%). In some relevées, the occurrence of invasive youth from tree species was found, these are: *Betula pendula* (2.25%), *Populus tremula* (1.29%), *Robinia pseudacacia* (1.25%) (Table 1).

*Agrostis capillaris* is a valuable grass forage, with a high degree of consumability, with a qualitative index of 3. In general, the pastoral value of this grassland is medium and good, reaching a production of 10-15 t/ha green mass and having a grazing capacity of 1-1.2 large cattle unit/ha, for pastures with good pastoral value and a production of 5-7.5 t/ha green mass and a grazing capacity of 0.5-0.8 large cattle unit/ha for grasslands with medium pastoral value.

Table 1

The pastoral value of *Agrostis capillaris* grasslands from Tășad Hills

No. relevées	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	%PC	IC	PC x IC	
GPS coordonates	Altitude (m)	405	395	400	370	360	320	350	440	245	380	350	350	225	202	200	290	290	315	295	300	300	300	385	230	285	320	315	340			
	Lat. N	46.34418	46.94038	46.93820	46.93701	46.93677	46.94056	46.94053	46.92276	46.97466	46.96839	46.96750	46.96845	46.99686	47.00202	47.01858	46.97999	46.98500	46.99171	46.97878	46.97393	46.96982	46.96143	46.95340	46.97146	46.97866	46.98726	46.98905	46.95923			
	Long. E	22.19380	22.18880	22.19130	22.19492	22.20059	22.20238	22.19864	22.20655	22.17095	22.14998	22.15769	22.16218	22.11307	22.11249	22.12520	22.11971	22.22277	22.24014	22.24999	22.24730	22.24478	22.22995	22.24911	22.18631	22.18811	22.19092	22.20579	22.20909			
Exposition	S	SV	S,SE	N	N	E,SE	S,SE	SV	S,SV	N	NE	NE	N,V,E	-	-	V	S,SV	S,SE	V,SV	V	NE	SV	N,NV	S,SE	S	SE	NV,V	N,NV				
Slope (degree) (%)	15.81	8.77	13.08	15.59	12.34	20.48	17.81	16.44	15.47	17.62	18.51	14.95	11.29	7.97	6.87	10.49	10.46	19.14	17.81	17.21	12.5	15.14	13.46	11.97	8.25	14.47	20.57	13.28				
Herbaceous layer coverage (%)	65	72	58	84	58	84	75	78	90	85	80	96	60	75	93	85	93	92	92	92	95	67	88	91	95	95	97	95				
Shrubby layer (%)	35	28	42	16	42	16	25	22	10	15	20	4	40	25	7	15	7	8	8	8	5	33	12	9	5	5	3	6				
Area (m <sup>2</sup> )	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100				
<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>	<i>15</i>	<i>16</i>	<i>17</i>	<i>18</i>	<i>19</i>	<i>20</i>	<i>21</i>	<i>22</i>	<i>23</i>	<i>24</i>	<i>25</i>	<i>26</i>	<i>27</i>	<i>28</i>	<i>29</i>	<i>30</i>	<i>31</i>	
<b>Poaceae (%)</b>	<b>(62)</b>	<b>(60)</b>	<b>(60)</b>	<b>(78)</b>	<b>(55)</b>	<b>(74)</b>	<b>(65)</b>	<b>(61)</b>	<b>(58)</b>	<b>(75)</b>	<b>(81)</b>	<b>(77)</b>	<b>(70)</b>	<b>(67)</b>	<b>(75)</b>	<b>(72)</b>	<b>(70)</b>	<b>(70)</b>	<b>(63)</b>	<b>(74)</b>	<b>(65)</b>	<b>(79)</b>	<b>(70)</b>	<b>(75)</b>	<b>(69)</b>	<b>(70)</b>	<b>(65)</b>	<b>(65)</b>	<b>69.11</b>			
<i>Agrostis capillaris</i>	50	50	50	60	50	60	50	50	55	55	60	60	55	50	60	65	50	50	60	50	60	50	60	55	50	50	55	60	50	54.29	3	162.87
<i>Lolium perenne</i>	3	3	+	10	+	5	5	5	+	8	15	5	+	+	5	+	3	2	5	3	3	1	5	2	5	+	7	3	3.68	5	18.4	
<i>Festuca rubra</i>	3	6	+	3	5	3	3	5	+	5	3	3	3	+	2	2	+	+	+	2	5	10	1	+	+	+	5	2.46	3	7.38		
<i>Festuca pratensis</i>	2	+	+	+	+	+	+	+	+	2	1	3	2	+	1	+	+	+	5	3	2	1	+	+	+	+	+	2	0.89	5	4.45	
<i>Cynosurus cristatus</i>	+	+	+	1	+	1	+	+	1	1	+	1	3	+	2	+	+	+	+	2	3	2	2	+	1	+	+	2	0.79	3	2.37	
<i>Holcus lanatus</i>	+	+	+	1	+	+	+	+	+	1	+	1	5	10	+	5	+	+	+	+	1	+	1	5	+	1	+	+	1.11	2	2.22	
<i>Poa pratensis</i>	1	+	+	1	+	+	+	+	+	2	2	1	+	3	+	+	+	+	1	1	2	+	+	+	+	+	+	0.5	4	2		
<i>Festuca valesiaca</i>	2	+	10	+	+	1	2	+	1	+	+	1	+	+	+	+	+	2	+	+	+	+	+	+	+	+	+	2	0.75	2	1.5	
<i>Festuca rupicola</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	5	5	+	+	+	+	+	3	+	5	+	0.64	2	1.28		
<i>Phleum pratense</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	3	+	+	+	+	+	+	+	+	+	+	+	+	0.11	5	0.55		
<i>Aniioxanthum odoratum</i>	+	+	+	1	+	2	+	1	1	+	+	1	2	+	1	+	+	+	+	1	+	1	1	1	+	1	+	1	0.5	1	0.5	
<i>Cynodon dactylon</i>	+	+	+	+	+	1	+	+	+	+	+	+	+	+	+	+	2	1	+	+	+	+	+	+	10	+	+	0.5	1	0.5		
<i>Festuca arundinacea</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	3	+	+	+	+	+	+	+	+	+	+	+	+	+	0.11	3	0.33		
<i>Agropyron repens</i>	+	+	+	1	+	+	+	+	+	+	+	+	+	1	+	+	+	+	+	+	+	+	+	+	+	+	+	0.07	2	0.14		
<i>Dichanthium ischaemum</i>	+	+	+	+	+	5	+	+	+	+	+	+	+	+	+	10	10	2	+	+	+	20	+	15	3	+	2.32	0	0			
<i>Calamagrostis epigejos</i>	+	+	+	+	+	+	+	+	1	+	+	+	+	+	+	+	+	1	+	3	1	+	+	+	+	+	0.21	0	0			
<i>Danthonia decumbens</i>	1	1	+	+	+	1	+	+	+	+	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0.14	0	0			
<i>Deschampsia caespitosa</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	1	+	+	+	+	+	+	+	+	+	+	+	+	0.04	0	0			
<i>Dactylis glomerata</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	5	0	0		
<i>Arrhenatherum elatius</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	4	0	0		
<i>Briza media</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	1	0	0		
<i>Brachypodium pinnatum</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	1	0	0		
<i>Setaria pumila</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	0		
<i>Vulpia myuros</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	0		
<i>Nardus stricta</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	0		

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
<b>Fabaceae (%)</b>	<b>(5)</b>	<b>(4)</b>	<b>(3)</b>	<b>(4)</b>	<b>(4)</b>	<b>(3)</b>	<b>(5)</b>	<b>(3)</b>	<b>(5)</b>	<b>(6)</b>	<b>(6)</b>	<b>(6)</b>	<b>(7)</b>	<b>(7)</b>	<b>(8)</b>	<b>(6)</b>	<b>(8)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(6)</b>	<b>(2)</b>	<b>(8)</b>	<b>(6)</b>	<b>(7)</b>	<b>(4)</b>	<b>(6)</b>	<b>(7)</b>	<b>5.39</b>						
<i>Trifolium repens</i>	2	1	1	2	2	1	2	3	1	3	2	2	2	5	3	3	1	+	2	3	2	1	4	1	5	+	4	2	2.14	5	10.7				
<i>Lotus corniculatus</i>	1	2	1	1	1	1	1	+	1	1	2	2	2	2	2	2	2	2	2	2	3	1	2	1	2	2	2	2	1.61	4	6.44				
<i>Trifolium pratense</i>	+	+	•	+	1	+	•	+	+	1	1	1	1	+	2	1	+	1	•	1	1	+	2	+	•	•	•	1	0.5	5	2.5				
<i>Trifolium campestre</i>	2	1	1	•	+	1	1	+	2	1	•	1	1	•	+	+	2	+	1	+	+	+	+	+	+	+	+	+	1	0.53	2	1.06			
<i>Trifolium hybridum</i>	+	+	+	1	+	+	1	+	+	1	+	+	+	1	•	•	+	+	•	+	+	+	+	+	•	•	•	1	0.18	4	0.72				
<i>Trifolium arvense</i>	•	•	•	•	•	•	•	+	•	+	•	•	1	+	•	+	+	•	+	•	+	•	•	+	+	+	+	+	0.04	2	0.08				
<i>Dorycnium pentaphyllum</i>	•	•	+	•	•	•	•	•	1	+	•	•	+	+	+	+	3	1	+	+	•	+	+	3	•	2	•	+	0.35	0	0				
<i>Ononis spinosa</i>	•	•	•	•	•	•	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	0	0		
<i>Medicago lupulina</i>	•	•	•	•	•	•	•	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	4	0	
<i>Lathyrus pratensis</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	+	4	0
<i>Coronilla varia</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	+	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2	0
<i>Trifolium medium</i>	+	+	+	•	+	•	•	+	+	+	+	+	+	•	•	•	•	•	•	+	+	+	+	•	•	•	•	•	•	•	•	•	•	2	0
<i>Genista tinctoria</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	+	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	0	0
<b>Other families (%)</b>	<b>(6)</b>	<b>(6)</b>	<b>(7)</b>	<b>(8)</b>	<b>(6)</b>	<b>(8)</b>	<b>(10)</b>	<b>(8)</b>	<b>(12)</b>	<b>(9)</b>	<b>(8)</b>	<b>(12)</b>	<b>(8)</b>	<b>(16)</b>	<b>(9)</b>	<b>(10)</b>	<b>(5)</b>	<b>(4)</b>	<b>(9)</b>	<b>(5)</b>	<b>(6)</b>	<b>(6)</b>	<b>(12)</b>	<b>(7)</b>	<b>(9)</b>	<b>(6)</b>	<b>(6)</b>	<b>(9)</b>	<b>8.11</b>						
<i>Daucus carota</i>	+	+	+	1	+	+	•	+	+	•	•	1	3	2	3	3	+	+	•	+	•	+	+	4	3	+	+	1	0.75	2	1.5				
<i>Achillea millefolium</i>	+	+	+	•	+	1	+	1	+	1	+	1	+	+	+	1	+	+	+	+	+	+	1	+	1	+	1	1	0.32	2	0.64				
<i>Plantago lanceolata</i>	+	+	1	+	1	1	+	+	+	1	+	1	+	+	+	1	+	+	+	+	+	+	+	1	+	•	1	+	+	0.29	2	0.58			
<i>Leontodon hispidus</i>	•	•	•	2	+	2	1	1	•	+	+	+	•	+	+	+	+	+	+	•	2	+	2	+	1	1	1	3	0.57	1	0.57				
<i>Potentilla erecta</i>	+	+	+	•	•	+	2	+	+	1	+	+	•	+	+	+	+	+	+	+	+	+	+	•	•	+	+	+	0.11	1	0.11				
<i>Cichorium intybus</i>	+	+	•	•	•	•	+	+	+	+	•	+	+	+	1	+	+	+	+	+	+	+	•	•	1	+	•	+	0.07	1	0.07				
<i>Pimpinella saxifraga</i>	+	•	+	•	+	•	+	+	•	+	+	•	+	+	+	1	+	•	+	+	+	+	•	+	+	1	•	+	0.07	1	0.07				
<i>Fragaria vesca</i>	•	•	+	+	+	•	+	+	+	1	+	•	•	+	•	•	+	+	+	+	+	+	•	+	1	•	•	•	•	0.07	1	0.07			
<i>Thymus glabrescens</i>	2	2	3	•	+	2	3	2	8	2	1	3	3	+	+	1	2	2	3	2	2	+	1	1	•	1	1	+	1.68	0	0				
<i>Juncus effusus</i>	1	+	•	3	3	+	5	+	+	1	3	1	+	+	+	1	+	+	1	2	+	1	5	+	•	3	2	1.14	0	0					
<i>Hieracium pilosella</i>	2	2	2	1	+	1	2	2	2	1	2	+	+	+	1	1	2	2	1	+	+	1	+	+	•	1	+	1	1	0	0				
<i>Centaurea phrygia</i>	+	+	+	•	+	+	+	+	•	+	+	+	+	1	3	+	•	+	+	•	+	2	+	+	1	+	+	+	0.25	0	0				
<i>Potentilla anserina</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	7	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	0.25	0	0
<i>Carex hirta</i>	+	+	•	+	1	•	+	+	+	1	+	1	•	•	+	1	•	•	+	+	+	+	1	•	•	•	•	1	0.21	0	0				
<i>Carex caryophyllea</i>	•	•	+	•	+	+	+	+	2	1	•	+	•	•	•	•	1	+	•	+	+	•	•	+	1	+	+	+	0.18	0	0				
<i>Euphrasia stricta</i>	1	+	1	•	1	1	+	•	•	+	•	•	•	•	•	+	•	+	+	+	+	1	+	+	•	+	+	+	0.18	0	0				
<i>Juncus inflexus</i>	•	•	•	+	•	•	•	•	•	•	•	•	•	•	•	+	+	+	3	+	1	•	+	+	•	•	•	•	•	•	•	•	0.14	0	0
<i>Veronica officinalis</i>	+	+	+	•	+	+	+	+	+	+	1	2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	+	0.11	0	0			
<i>Erigeron annuus</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	1	+	+	1	+	+	+	0.07	0	0				
<i>Galium mollugo</i>	•	•	•	+	•	•	•	•	•	+	+	+	+	+	2	+	•	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	0.07	0	0
<i>Mentha longifolia</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	2	•	•	•	•	•	+	+	•	•	•	•	•	•	•	•	•	•	•	0.07	0	0
<i>Lythrum salicaria</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	2	+	•	•	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	0.07	0	0
<i>Senecio erucifolius</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	2	+	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	0.07	0	0
<i>Teucrium chamaedrys</i>	•	•	•	•	•	•	+	•	+	•	•	•	•	•	•	•	1	•	•	•	•	•	•	1	•	•	•	•	•	•	•	0.07	0	0	
<i>Typha latifolia</i>	•	2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	0.07	0	0	

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
<i>Eupatorium cannabinum</i>	•	•	+	•	+	+	+	•	•	•	•	•	•	+	•	•	•	+	+	•	•	2	•	•	•	+	•	•	0.07	0	0	
<i>Carlina vulgaris</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	0.07	0	0
<i>Bellis perennis</i>	+	+	•	1	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	0.04	0	0
<i>Convolvulus arvensis</i>	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Galium verum</i>	•	•	•	•	•	•	•	•	•	•	•	•	+	+	+	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Prunella vulgaris</i>	+	+	•	•	+	+	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Rumex acetosa</i>	•	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Prunella laciniata</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Mentha pulegium</i>	+	•	•	+	•	•	+	•	•	•	•	+	+	+	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Filago germanica</i>	+	•	•	+	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Erigeron canadensis</i>	+	+	•	+	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Agrimonia eupatoria</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Potentilla argentea</i>	•	•	•	+	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Cerastium holosteoides</i>	•	•	•	+	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Centaurium erythraea</i>	+	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Odontites vulgaris</i>	•	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Gypsophila muralis</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Juncus tenuis</i>	+	+	•	+	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Viola tricolor</i>	+	+	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Spiranthes spirales</i>	+	+	•	•	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Cruciatia glabra</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Verbena officinalis</i>	•	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Potentilla reptans</i>	•	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Lysimachia nummularia</i>	+	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Epilobium roseum</i>	•	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Juncus conglomeratus</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Polygonum aviculare</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Polygala vulgaris</i>	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Clinopodium vulgare</i>	+	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Lysimachia vulgaris</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Filipendula hexapetala</i>	•	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Scabiosa ochroleuca</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Gnaphalium sylvaticum</i>	•	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Inula hirta</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Carum carvi</i>	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Senecio jacobaea</i>	•	•	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Hypochaeris radicata</i>	+	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Inula britannica</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Pulicaria vulgaris</i>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•





## CONCLUSIONS

In the area under study, considering pastoral value, *Agrostis capillaris* grassland of medium productivity (20 relevées) and good productivity (8 relevées), were found.

The pastoral value of all studied grassland is medium (V.P.=45.92). A significant proportion of toxic and harmful species is observed in some relevées (*Eryngium campestre*, *Pteridium aquilinum*, *Eryngium campestre*, *Ranunculus polyanthemos*, *Cardus acanthoides*, *Ambrosia artemisiifolia*), this decreases their pastoral value. For the removal of toxic and harmful species from the studied grassland, work is needed to combat mechanical, chemical and biological methods, overgrowing the remaining gaps.

The woody species are also present in this grassland in shrub or invasive form of tree species, works to combat them and the overgrowth of the remaining gaps being also necessary.

The overgrowth of the grasslands will be carried out with local species of plants, wishing to preserve their natural composition.

Fertilization work with organic and chemical fertilizers are required to increase the productivity of the grassland studied.

Due to the small number of animals that graze on these pastures in the future, some of them will be covered by woody vegetation, receiving another destination.

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