

CONTRIBUTION TO THE ASSESSMENT OF GRASSLANDS PRODUCTIVITY BETWEEN JIU - DEZNĂȚUI - CRAIOVA AND DANUBE

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Abstract. *The evaluation of grasslands productivity with indices of pastoral value, production of green mass and milk from areas less studied, completes the data for the following syntheses of this kind, necessary for the preparation of pastoral development projects. The results at the vegetal association level highlighted the higher value of the phytocenoses *Lolietum perennis* and *Poaetum pratensis* from the *Agrostidion albae* alliance and lower for *Brometum arvense* from the *Festucion valesiacae* alliance. In general, the grasslands in the study area with an average production of 10 t/ha green mass, almost 57 pastoral value index, 5,180 liters of cow's milk at a load of 0.8 LU/ha in 160 days of grazing are rated as good in relation to the country average.*

Keywords: permanent grassland, pastoral value, grazing capacity, production of green mass, cow's milk production

DOI <https://doi.org/10.56082/annalsarsciagr.2023.2.45>

1. Introduction

In the process of drawing up the pastoral arrangements, it is mandatory to know the grasslands productivity in order to establish the technologies for improvement and rational use [1].

Since there were and still are many obstacles and expenses for the concrete determination of production on the ground by fencing some sample areas, mowing, weighing, etc., the evaluation based on floristic survey was proposed as being much easier and accessible [2].

Until now, numerous phytocoenoses and grasslands habitats have been analyzed and evaluated, which have been synthesized per country in a first approximation [6, 10].

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In order to have a more accurate picture of the productivity (pastoral value and green mass production) of other phytocenoses and habitats located in different natural conditions than those studied so far, it is necessary to continue this kind of evaluation.

The present work is part of these important objectives stated before, with the evaluation of productivity by the floristic method in the area of plains and meadows less studied so far.

2. Materials and Methods

In order to continue the evaluation of the productivity of the grasslands we used the surveys from the summary of the doctoral thesis entitled "*Geobotanical and agroproductive study of the grasslands between Jiu - Desnățui - Craiova and Danube, Dolj county*" prepared by Dumitru Șt. Cârțu, under the scientific leadership of Prof. Ioan Safta, from the Faculty of Agriculture of the Agronomic Institute in Timișoara.

Outline of the main phytocenoses of grasslands:

Class MOLINIO - ARRHENATHERETEA, Tx.37

Ord. *MOLINIETALIA*, Koch 1926

Al. *Agrostidion albae*, Soó 1933

1. As. *Agrostetum stoloniferae* Ujv. 1941, Soó 1971
2. As. *Agrostetum caninae*, Harg 1942
3. As. *Poaetum silvicolae oltenicum*, Buia, Păun, Safta et Pop 1959
4. As. *Lolietum perennis*, Safta 1943
5. As. *Alopecuretum pratensis*, Nowinski 1928
6. As. *Poaetum pratensis angustifoliae*, Burd., Debr., Răv., Căz., Bîrcă., Racl., Turen., 1956

Class FESTUCO – BROMETEA, Br.-Bl. 1943

Ord. *FESTUCETALIA VALESIIACAE*, Br-Bl et Tx. 1943

Al. *Festucion valesiaca*, Br.-Bl. 1936

7. As. *Brometum arvense*, Cârțu M., Cârțu 1972-1976
8. As. *Chrysopogonetum grylli oltenicum*, Buia, Păun, Safta et Pop 1959
9. As. *Festucetum rupicolae*, Burd., Debr., Grîn., Răv., Căz., Bîrcă., Racl., Turen., 1956
10. As. *Stipo (stenophyllae)-Festucetum*, Cârțu 1972

Class PLANTAGINETEA MAJORIS, Tx. et Preg., 1950

Ord. *PLANTAGINETALIA MAJORIS*, Tx. (1947), 1950

Al. *Polygonion avicularis*, Br. – Bl. 1931

11. As. *Centaurea(ibericae)-Lolietum*, Cârțu M., Cârțu 1972-1976
12. As. *Rumici-Alopecuretum aequalia* Cârțu 1972

The working method was presented in numerous other works published in the current annals [3, 4, 5, 7, 8, 9, 11, 12], so it is not repeated.

3. Results and Discussions

A number of 12 more widespread associations belonging to 3 alliances, 3 orders and 3 vegetation classes were analyzed, according to the outline presented before.

The average participation in the grass carpet of species with fodder value is 76%, being considered quite high (Table 1).

Table 1. Participation of forage species, pastoral value and grasslands production of green mass

No.	Grassland Association	Species structures (%)		Pastoral value		Green mass production	
		Forager	Harmful	ind.	%	t/ha	%
Al. <i>Agrostidion albae</i>							
1	<i>Agrostetum stoloniferae</i>	92	8	77.3	136	14.73	147
2	<i>Agrostetum caninae</i>	67	33	51.2	90	9.00	90
3	<i>Poaetum silvicolae</i>	98	2	79.4	140	16.37	164
4	<i>Lolietum perennis</i>	97	3	84.2	149	16.57	166
5	<i>Alopecuretum pratensis</i>	67	33	53.3	94	8.73	87
6	<i>Poaetum pratensis ang.</i>	95	5	83.2	147	16.48	165
Al. <i>Festucion valesiacae</i>							
7	<i>Brometum arvense</i>	39	61	21.7	38	3.31	33
8	<i>Chrysopogonetum grylli</i>	70	30	39.5	70	8.95	90
9	<i>Festucetum rupicolae</i>	78	22	48.4	85	6.65	67
10	<i>Stipo - Festucetum</i>	73	27	45.4	81	4.64	46
Al. <i>Polygonion avicularis</i>							
11	<i>Centaurea - Lolietum</i>	75	25	56.6	100	9.65	97
12	<i>Rumici - Alopecuretum</i>	65	35	10.1	71	5.17	52
	AVERAGE	76	24	56.7	100	10.00	100

A proportion of more than 95% participation of forage species was found in the associations *Lolietum perennis*, *Poaetum silvicolae* and *Poaetum pratensis-augustifolia* with only 2-5% participation of harmful species.

Brometum arvense has a higher proportion of harmful species of 61% and a further 33-35% was recorded in the *Rumici* associations - *Alopecuretum*, *Alopecuretum pratensis* and *Agrostetum caninae*, an aspect that directly influences the pastoral value.

Very good indices of pastoral value of 82-84 were evaluated in the associations *Lolietum perennis* and *Poaetum pratensis-augustifolia* and the lowest of only 10 in *Rumici - Alopecuretum*, with just over 20 in *Brometum arvense*.

Regarding the production of green mass, over 16 t/ha was assessed for *Lolietum perennis*, *Poaetum pratensis* and *Poaetum silvicolae* and the lowest over 3 t/ha for the *Brometum arvense* association.

At the phytosociological alliances level, which are closer to Natura 2000 habitats, the average load with animals per hectare was assessed at 0.8 LU, being considered medium (Table 2).

Table 2. Optimal loading and cow milk production of grassland phytosociological alliances in 160 days of grazing

Phytosociological Alliance	Green mass production (t/ha)	Loading LU/ha	%	Pastoral value (ind)	Milk production (L/ha)	%
1. <i>Agrostidion albae</i>	13.65	1.31	152	71.4	7,000	135
2. <i>Festucion valesiacaе</i>	5.89	0.58	67	38.8	3,800	73
3. <i>Polygonion avicularis</i>	7.31	0.70	81	48.4	4,740	92
AVERAGE	8.95	0.86	100	52.9	5,180	100

On *Agrostidion albae* alliance with meadows moisture, the load of 1.31 LU/ha is rated as good and in *Festucion valesiacaе* in drier areas with a load of 0.55 LU/ha it is rated as poor.

As a result of the optimal level of animal loading per unit area depending on the grass production and its fodder value, the average milk production at the alliance level reaches 5180 liters per hectare.

Milk yield, as expected, of 7000 liters/ha was evaluated in *Agrostidion albae* and the lowest of 3800 liters/ha in *Festucion valesiacaе*.

Expressing grassland productivity in animal products still serves to calculate the economic efficiency of livestock rearing on permanent grasslands.

Conclusions

(1) The grasslands from the study area have a higher productivity due to their majority distribution in meadows with assured humidity.

(2) Pastoral value indices (PV) of more than 80 and green mass production (GMP) of more than 16 t/ha are obtained in the *Lolietum perennis* and *Poaetum pratensis-augustifolia* associations with 7,000 liters of milk in the *Agrostidion albae* alliance at a loading of 1.3 LU/ha in 160 days of grazing, are the best results.

(3) Poorer results are obtained in the *Brometum arvense* association with 21 PV, 33 t/ha GMP and in the *Festucion valesiacaе* alliance with 3,800 liters of cow's milk per hectare at a load of 0.55 LU/ha in the same period of 160 days of grazing.

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