

NOTA BREVE

EFFECT OF CATTLE GRAZING ON UNWATERED FOOTHILL PASTURES IN CENTRAL NORTHERN BULGARIA

EFFECTO DEL PASTOREO BOVINO EN PASTOS NATURALES Y SEMBRADOS EN BULGARIA CENTRAL DEL NORTE

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ADDITIONAL KEYWORDS

Dry matter yields. Botanical composition. Chemical content. Natural pasture. Sown pasture.

PALABRAS CLAVE ADICIONALES

Producción herbácea. Composición botánica. Composición química.

SUMMARY

The effect of grazing Hornless Hereford on the productivity, botanical and chemical composition of unwatered natural forest and sown pastures in Central Northern Bulgaria, was studied. The sown pasture averaged 8.76 t D.M./ha, 143.4 percent higher than natural pasture (greatest average productivity: 6.35 t D.M./ha). In both stands the grasses predominate on leguminosae. The sown pasture has more leguminosae and less weed than natural pasture. The crude protein content was 16.71 percent (1465.5 kg/ha) in sown pasture and 12.21 percent (448.0 kg/ha) in natural pasture, this was richer in Ca and poorer in P.

p.100, 448 kg/ha) y éste fue más rico en Ca y más pobre en P.

INTRODUCTION

The natural pastures in Bulgaria are 23.8 percent of usable agricultural areas and artificial (sown) pastures until recently occupied 215.000 ha, but they are decreasing annually. Most of natural pastures (62.4 percent) are in the mountain regions and usually are grazed by the parcel system. The object of this study was to establish the effect of Hornless Hereford grazing on grass productivity and botanical and chemical composition of unwatered natural forest and artificial (sown) pastures in the foothill regions of Central Northern Bulgaria.

RESUMEN

Se estudió el efecto del pastoreo con ganado Hereford sin cuernos sobre productividad, composición botánica y química de pastos naturales y sembrados en Bulgaria. El pasto sembrado (media 8,76 t M.S./ha) superó en 143,4 p.100 al natural (6,35 t M.S./ha como máximo). En ambos pastos las gramíneas fueron más abundantes pero en el sembrado había más leguminosas y menos de otras plantas. El sembrado además contenía más proteína (16,71 p.100, 1465,5 kg/ha) que el natural (12,21

MATERIAL AND METHODS

The experiment was carried out on a

natural forest pasture (*Chrysopogon gryllus* type) situated at 520 m above sea-level. There were 8 plots; numbers 5 and 8 were sown with *Dactylis glomerata*, *Festuca rubra*, *Lotus corniculatus* and *Trifolium pratense* (1:1:1:1).

Pastures were grazed from a herd of Hornless Hereford, cattle (100 cows and 98 calves in 1984, 98 cows and 92 calves in 1985 and 96 cows and 84 calves in 1986).

The natural pasture was fertilized with P (100 kg/ha a.s.) and N (120 kg/ha a.s.) and the sown pasture with N (180 kg/ha a.s.); P (300 kg/ha) and K (100 kg/ha) were scattered before the ploughing.

The following indices were studied: production of dry matter (t/ha); botanical composition: it was established total share of the grasses, legumes and weeds (in percent); chemical content of the dry matter (crude protein by Kjeldahl, crude cellulose by Heteron and Jensen, Ca by Stotz and P by Gerike and Kurmis methods).

The mean duration of the pasture period during the experiment was 177.7

days and of one pasture cycle, 35.5 days. Each year, 5 pasture cycles were carried out. The optimal grazing time for one parcel varied from 5-7 to 15 days.

RESULTS AND DISCUSSION

The dry matter (**table I**) ranged, in the first year (1984), from 1.34 t/ha (var. 6) to 4.97 t/ha (var. 2) for the natural pasture and averaged 5.42 t/ha for the sown pasture. The greatest values were on the 3rd year (1986); it was a mean increase of 80.8 percent for the natural pasture and of 122.9 percent for the artificial pasture in comparison with 1984. During the 3 years the highest dry matter yields were recorded in the sown pasture: 38.7 percent higher than standard pasture (var. 1) in 1984 and considerably more high (149.8 percent) in 1985 and (258.4 percent) in 1986.

During the experimental period the highest dry matter production from the natural pasture was obtained from var. 2 and 7, in which the wood's vegetation

Table I. Factual productivity of dry matter. (Producción de materia seca).

Variants	area (ha)	1984		1985		1986		Average	
		t/ha	percent	t/ha	percent	t/ha	percent	t/ha	percent
1 (St.)	9.2	3.91	100.0	3.52	100.0	3.37	100.0	3.60	100.0
2	10.0	4.97	127.1	5.25	149.1	5.33	158.2	5.18	143.9
3	11.0	4.47	114.3	4.85	137.8	5.01	148.7	4.78	132.8
4	9.1	4.45	113.8	5.09	144.6	5.54	164.4	5.03	139.7
5 (sown)	5.7	5.65	144.5	8.92	253.4	12.14	360.2	8.90	247.2
6	14.0	1.34	34.3	2.47	70.2	3.48	103.3	2.43	67.5
7	5.0	4.81	123.0	6.32	179.5	7.91	234.7	6.35	176.4
8 (sown)	7.2	5.20	133.0	8.67	246.3	12.02	356.7	8.63	239.7

Note: No mathematical processing of the dry matter yields was made due to lack of repetitions.

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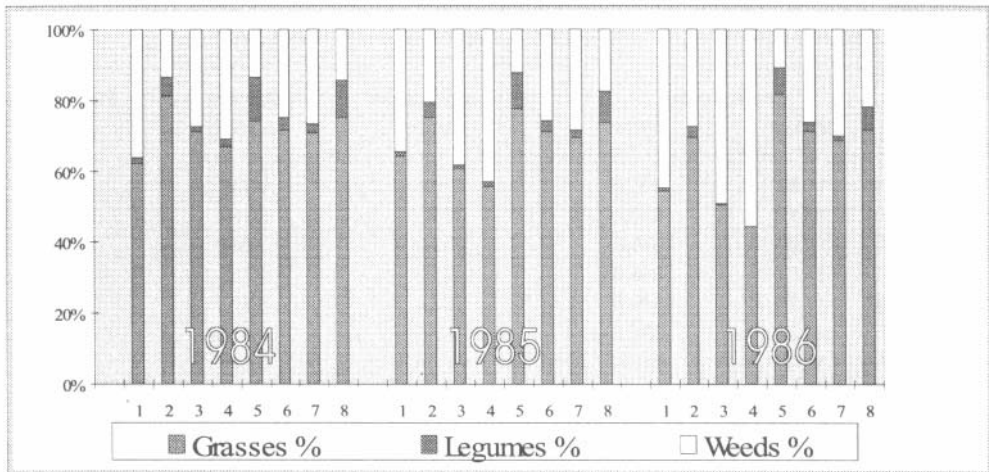


Figure 1. Botanical composition of pastures. (Composición botánica de los pastos).

density was lesser - respectively 5.18 t/ha and 6.35 t/ha, these figures were 43.9 percent and 76.4 percent more high of that of standard (var. 1). The two parcels of the sown pasture had almost the same productivity - 8.63 t/ha (var. 8) and 8.90 t/ha (var. 5) and its average value was 143.4 percent higher than the production of standard parcel of natural pasture.

In the first year (1984) the grasses varied from 62.3 (var. 1) to 81.1 percent (var. 2) against to 1.1-5.6 percent for legumes and for sown pasture the grasses varied from 74.2 percent (var. 5) to 76.1 percent (var. 8) against to 10.5-12.2 percent (figure 1).

In the 2nd year the differences were the following: from 55.5 percent (var. 4) to 75.3 percent (var. 2) against 0.8-4.3 percent in natural pasture and from 73.9 percent (var. 8) to 77.9 percent (var. 5) against 8.5-9.8 percent in the sown one.

In the last year (1986) there was a tendency to decrease of the legume participation and increase of the weeds.

In the same time the legume participation was 6.5 to 7.5 percent. It was a great decrease of *Chrysopogon gryllus* participation in the grass stand of the natural pasture, in which began to grow other grasses (*Festuca fallax*, *Agrostis capillaris*, etc) and legumes (*Lathyrus pratensis*, *Trifolium* sp. etc).

As average from the experimental period the sown pasture have had the higher content and yields of crude protein: 16.04 percent (var. 8) and 17.38 percent (var. 5), respectively to 1384.3 kg/ha and 1546.8 kg/ha (table II). The natural pasture deferred on this indices considerably - varied from 11.13 percent (var. 1) to 13.24 percent (var. 6) respectively from 421.7 kg/ha to 816.6 kg/ha. In comparison, the forage from both pasture types had a similar crude cellulose's content - average of 27.51 percent (the standard was 27.01 percent) from the natural pasture against 27.82 percent from the sown pasture. The P content was higher in the sown pasture -

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Table II. Chemical content of the dry matter. (Composición de la materia seca).

Variants	Crude protein		Crude cellulose percent	Calcium percent	Phosphorus percent
	percent	kg/ha			
1(St.)	11.13	400.7	27.01	0.718	0.277
2	12.17	630.4	26.43	0.763	0.271
3	12.03	575.0	29.92	0.882	0.233
4	11.84	595.6	27.30	0.744	0.282
5 (sown)	17.38	1546.8	28.14	0.602	0.359
6	13.24	321.7	26.18	0.740	0.301
7	12.86	816.6	27.74	0.691	0.335
8 (sown)	16.04	1384.3	27.51	0.604	0.427

average of 0.393 percent against 0.284 percent, but the Ca content was higher in

the natural pasture (average 0.786 percent against 0.603 percent).

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