

Overgrazing influence on the presence of legumes in a natural pasture of Sardinia

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Introduction The knowledge of forage production and botanical composition in natural pasture is essential to plan forage crop systems. Floristic balance often changes due to overgrazing, which affects forage quality and causes the disappearance of less competitive and more palatable species. This trial aimed to evaluate the forage yield in a natural pasture and to verify the effect on botanical composition of overgrazing by dairy ewes.

Materials and methods In a typical pastoral hill located in central Sardinia, a native marginal pasture of 10 ha was studied regarding its herbage production in 2002 and from the floristic point of view in 2003. According to long-term traditions and usage in this area, the field was grazed with a high stocking rate. In the first year, 15 exclusion cages of 18 m² were placed to evaluate the offered herbage yield; the grazed forage was determined by the difference technique (Frame 1981). All forage samples collected in 0.5 m² were partitioned in floristic groups to determine their botanical composition and oven-dried to evaluate the content of dry matter. In the second year the field was divided in two parts; one part was grazed in winter and spring and the other was ungrazed. In the spring period, the floristic composition in both fields was determined by linear analysis (Daget & Poissonet 1969; Pignatti 1982) with 15 lines each.

Results Forage dry matter yield in the first year was 3.2 t/ha; only half was utilized due to its low quality. Overgrazing influenced botanical composition; in comparison with the herbage collected in the cages, the percentage of legumes in forage production decreased from 17 to 1%, whereas the percentage of grasses increased from 67 to 94% (Figure 1).

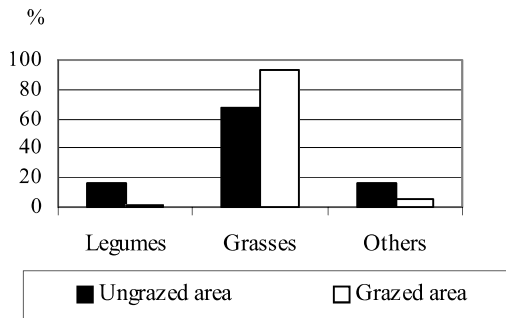


Figure 1 Forage yield percentage of floristic groups in the preserved and pastured areas after grazing (All data differ significantly at $P < 0.01$, t test)

Table 1 Predominant species and specific contribution (%) in the two swards

Predominant species	Ungrazed area	Grazed area
	SC%	SC%
<i>Hordeum marinum</i> Huds.	20.6	6.3
<i>Phalaris caerulea</i> Defs.	14.1	4.3
<i>Bromus hordeaceus</i> L.	12.5	7.3
<i>Vulpia ligustica</i> Lk.	8.7	8.6
<i>Trifolium subterraneum</i> L.	5.8	0.2
<i>Glyceria glabra</i> L.	5.1	0.7
<i>Vulpia sicula</i> Lk.	5.0	2.8
<i>Lotus ornithopodioides</i> L.	2.7	0.1
<i>Elymus caput medusae</i> L.	2.0	6.6
<i>Avena sterilis</i> L.	1.4	7.6

Floristic data confirmed this trend in the second year. In the pastured area, *Trifolium subterraneum* L. and *Lotus ornithopodioides* L., the most represented legume species, showed a minor presence in comparison with the preserved area, 0.2% versus 5.8% and 0.1% versus 2.7%, respectively (Table 1).

Conclusions Overgrazing influenced the quality of pasture production, reducing the presence of legume species. In each of the examined years and adopting two different methods to estimate botanical composition, the preservation from overgrazing increased the presence of legumes in the sward. The low frequencies of legumes assessed in the overgrazed sward show the risk of their disappearance, with possible loss of local biodiversity.

References

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