Managing forage allowance of natural grasslands for sustainable superfine wool production in Uruguay

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It has been indicated that is possible to conciliate an optimum pasture growth and quality with satisfactory animal production when using adequate levels of pasture utilization (Mott, 1973). During a three year period, the present study sought to evaluate the effect of different forage allowances of native grasslands on wool production and quality and sheep carrying capacity.

Twenty-four mature Merino wethers were allocated to four groups of six animals each on the basis of their body weight (BW) and expected progeny difference for clean fleece weight and fibre diameter. Four (3, 4, 5, and 6) forage allowances (kg of forage DM per 100 kg BW per day) were evaluated during a three year period. Forage allowance was monthly adjusted by put and take method (including or excluding additional wethers) considering forage mass, expected daily pasture growth and fasten BW of each treatment. Forage mass was estimated using the comparative yield method and the net herbage accumulation rate was assessed by the exclusion cages method. Animals were weighed every month and condition score was assessed at the same time. Fibre diameter and staple length were measured on the mid-side of the sheep using the patch technique. At shearing (September) of each year, fleece weight was recorded.

Regardless of year and season, forage allowance treatments were consistently associated with differences in forage mass (Figure 1), as a result of different animal grazing pressure and pasture growth rates. While BW and condition score evaluated at the end of the winter were affected ($P<0.05$) by treatments, wool production and quality did not (Table 1). After three years, the average sheep stocking rate did not indicate major differences between treatments (from 7.0 to 7.5 wethers/ha). However in the third year, the 6% forage allowance presented the largest sheep carrying capacity. Furthermore, as forage allowance increase a tendency of less variable carrying capacity through the year was observed.

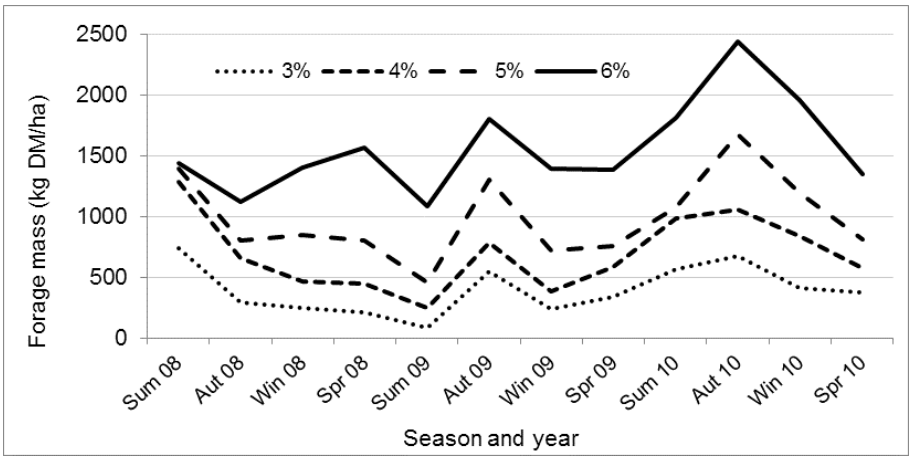

Figure 1. Three year seasonal evolution of the average forage mass (kg DM/ha) in accordance with the forage allowance. Forage allowance: 3% = 3 kg DM/100 kg BW, 4% = 4 kg DM/100 kg BW, 5% = 5 kg DM/100 kg BW, 6% = 6 kg DM/100 kg BW.

Table 1. Effect of forage allowance on fasted body weight and condition score at shearing (September) and on fleece weight, wool fibre diameter and wool staple length (mean±s.e.).

	Forage allowance (kgDM/100 kg BW)			
Trait	3	4	5	6
Body weight (kg)	49.1±1.2 [b]	48.5±1.3 [b]	49.9±1.3 [ab]	53.4±1.3 [a]
Condition score (units)	2.8±0.1 [b]	2.9±0.1 [b]	3.0±0.1 [ab]	3.2±0.1 [a]
Fleece weight (kg)	3.72±0.12	3.90±0.13	3.98±0.12	3.91±0.12
Fibre diameter (µ)	16.3±0.3	16.4±0.3	16.5±0.3	16.5±0.3
Staple length (cm)	7.8±0.2	7.9±0.2	8.5±0.2	8.5±0.3

[ab]Means within rows with differing letter are significantly different ($P < 0.05$). No interaction treatment and year was detected.

The use of forage allowances of 6% or more on native grasslands in the basaltic soils of Uruguay may promote a sustainable superfine wool production with a potential larger carrying capacity after three years than smaller forage allowances (5% or less). At that high forage allowance, we expect the inclusion of cattle for complementing the grazing behavior and pasture utilization of sheep will allow further improvements of our results.

Mott GO (1973) Evaluating forage production. In: Forages - The science of grassland agriculture, 3rd ed (eds Heath ME, Metcalfe DS, Barnes RF) pp. 126-135. Iowa State University Press, Ames, IA, USA.