

Effect of stocking rate and grazing system on fine and superfine Merino wool production and quality on native swards of Uruguay

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Introduction Modern textile tendencies show that consumers prefer light, soft, resistant, natural, and comfortable clothes, for which fine and superfine wools are in great demand, particularly at the high value markets (Whiteley, 2003). The main objective of the present study was to define sustainable stocking rates and grazing systems on native swards for fine and superfine wool production in the Basaltic region of Uruguay.

Materials and methods The trial was carried out for two years (October 2001 to October 2003), using the same 72 Australian Merino wethers in both years. The evaluated factors were stocking rate (SR, 5.3 and 8.0 animals/ha) and grazing system (GS, continuous -CG- and 21 days strip grazing -21G-), and their combination. The experimental area was 6.0 ha, (1.5 ha per treatment). The variables measured each 21 days were: a) on pre grazing swards: herbage mass (DM, kg DM/ha), sward height (H, cm), botanical composition (BC) and nutritive value; b) on all animals: liveweight (LW, kg) and condition score (CS, units); and c) on wool (annually): fleece weight (FW, kg), fibre diameter (FD, μ) and other quality characteristics. The design was a complete randomised block, arranged in a factorial structure, the main factors being: SR and GS at two levels each.

Results The SR of 5.3 animals/ha gave higher DM yield and H than the SR of 8.0 animals/ha (Table 1). The overall sward botanical composition and nutritive value were not affected by SR and GS. The BC (annual average) was: green grass leaf 48.0%, green grass stem 5.5%, dead material 40.0% and other species 6.5%; nutritive values were: CP 8.0%, NDF 68.5% and ADF .8%. BC and nutritive value were affected only by SR, essentially during spring and summer. A SR increase from 5.3 to 8.0 animals/ha resulted in higher sward quality. SR affected LW, CS and FW, associated with its effect on sward quantity and quality. Wool quality was not affected by SR (Table 2). GS did not significantly affect the variables related to animals and wool (Table 2).

Table 1 Effect of SR and GS on sward quantity characteristics

| Variable | SR | | GS | | | | SR*GS | | | | |
|---------------|-------|-------|----|-------|-------|----|---------|--------|---------|--------|----|
| | 5.3 | 8.0 | P | 21G | CG | P | 5.3*21G | 5.3*CG | 8.0*21G | 8.0*CG | P |
| DM (kg MS/ha) | 3043a | 1745b | ** | 2734a | 2054b | ** | 3593a | 2493b | 1875c | 1615d | ** |
| H (cm) | 10.8a | 6.1b | ** | 9.4a | 7.5b | ** | 12.3a | 9.3b | 6.5c | 5.7c | ** |

**= P<0.01. a, b, c, d = means with different letters between columns differ significantly (P<0.05).

Table 2 Effect of SR and GS on animal traits

| Variable | SR | | GS | | | SR*GS | |
|--------------|-------|-------|----|------|------|-------|----|
| | 5.3 | 8.0 | P | 21G | CG | P | P |
| LW (kg) | 51.2a | 46.5b | ** | 48.5 | 49.2 | ns | ns |
| CS (units) | 3.5a | 3.1b | ** | 3.3 | 3.3 | ns | ns |
| FW (kg) | 3.53a | 3.29b | * | 3.34 | 3.48 | ns | ns |
| FD (μ) | 18.5 | 18.4 | ns | 18.3 | 18.6 | ns | ns |

ns = P>0.05, * = P<0.05 and ** = P<0.01

Conclusions Stocking rate had the major impact on forage production and quality, liveweight and fleece weight production and wool quality in fine and superfine Merinos. Grazing system had a minor effect on production and quality). These results suggest that the advantage of using controlled grazing systems is limited for quantity and quality of fine and superfine wool production on native swards. The information generated in this study in the Basaltic region, highlights the possible implementation of high quality wool production systems with an interesting economical return when controlled grazing system, suitable stocking rate and known animal genetics merits are used.

References

Whiteley, K. (2003). Características de importancia en lanas finas y superfinas. In: Seminario Internacional de Lanas Merino finas y superfinas. Roberto Cardellino(Ed.) SUL, INIA, CLU& SCMAU. p. 17-22.