

Merino Sheep Grazing Preference Among Nine Cultivars of Tall Fescue

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There is a common perception among producers and plant breeders that grazing animal preference for a particular cultivar or species of pasture will lead to a higher voluntary intake and result in higher production gains. Many of the existing methods used to assess grazing preference are highly variable, have a low repeatability, are labour intensive and involve the use of expensive technology (Cougnon *et al.* 2018).

This experiment sought to assess whether Merino sheep exhibit a grazing preference among nine commercially available tall fescue (*Festuca arundinacea*) cultivars and where grazing preference was observed, determine if key plant quality attributes (Nitrogen, Sulfur, Phosphorus or Neutral Detergent Fibre) were predictors of preference. This experiment also sought to assess whether the use of time-lapse photography is an accurate method of assessing preference. Seven sheep were placed on each replicate (n=4) of nine cultivars of tall fescue in a randomised block design for two separate 10-day grazing periods (G1 and G2), with sheep randomly selected from a larger flock for each separate grazing period. Preference was assessed in terms of biomass removal, estimated with biomass cuts and selection ratio measurements (Shewmaker, Mayland & Hansen, 1997), as well as visual scoring of the percentages of plots grazed. In addition to these measures of preference, in G2, preference was measured by the proportion of time sheep spent on each plot as assessed by time-lapse cameras. Data was analysed in R using linear models, post hoc multiple comparisons and conditional inference trees.

No significant differences occurred with respect to preference measures in G1. In G2, when all cultivars were at a significantly higher leaf number, the cultivar Quantica MaxP had a significantly higher ($P<0.05$) selection ratio than all other cultivars except for Quantum II MaxP (Figure 1a). The proportion of time spent on plots was significantly correlated ($P<0.05$, $R^2=0.42$) to selection ratio in G2, with similar trends in cultivar preference (Figure 1b).

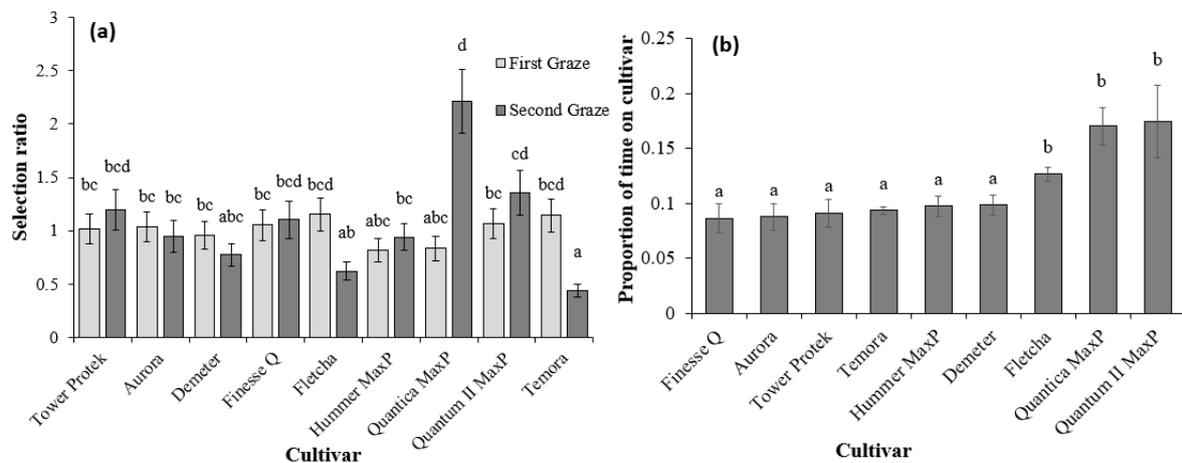


Figure 1. Merino sheep (a) selection ratio and (b) proportion of time spent on different cultivars of tall fescue.

When grazing preference was observed in G2, further analysis of plant quality parameters was conducted. However, although significant differences ($P<0.05$) were found between cultivars with respect to these parameters, none were found to be predictors of the apparent grazing preference in G2. Quantica MaxP appears to be preferred and highly productive and could result in relatively higher sheep production gains when grown under similar environmental conditions to the trial location. With further development of image processing software, the use of time-lapse photography may become a cheap and accurate method of assessing grazing preference in future, with a low labour requirement.

References

- Cougnon M, Shahidi R, Schoelynck J, Van Der Beeten I, Van Waes C, De Frenne P, ... & Reheul D (2018) *Grass and forage science*, 73(2), 330-339.
Shewmaker GE, Mayland HF, Hansen SB (1997) *Agronomy Journal*, 89(4), 695-701.