Grazing preference, herbage production and quality of diploid and tetraploid *Lolium perenne* cultivars in Southern Chile

O.A. Balocchi and I.F. López
Faculty of Agriculture, Institute of Animal Production, University Austral of Chile, PO Box 567, Valdivia, Chile, Email: obalocch@uach.cl

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Introduction *Lolium perenne* is the most important plant species used in sown pasture in Southern Chile. Cultivars used are mainly diploid. However, in recent years some tetraploid cultivars have been introduced into the country. The objective of the study was to determine the effect of the ploidy of the cultivars on herbage production, nutritive value, grazing preference and utilisation of the herbage.

Materials and methods The study was conducted in Southern Chile between 39° 47` 46`` and 39° 48`` 54` S and 73° 13` 13`` and 73° 12` 24`` W from April 1999 to May 2002. Cultivars used were Quartet (4n), Gwendal (4n), Pastoral (4n), Napoleon (4n), Anita (2n), Jumbo (2n), Aries (2n) and Yatsyn 1 (2n). When the average sward height reached 20 cm, all plots (50m^2 each) were grazed simultaneously by 8 dairy cows for 24 hrs. Before and after grazing, sward height (sward stick), dry matter availability (strip of 9 m^2 per plot, 4 cm from ground level) and nutritive value (CP and D value) were determined. Grazing preference was assessed visually every 5 min. during 2.5 hrs after the afternoon milking. Utilisation efficiency was calculated as a relationship between apparently consumed forage and pre-grazing DM availability. During the three years 22 grazing events were evaluated in a randomised block with eight cultivars and three replicates.

Results Overall, diploid cultivars showed greater herbage mass accumulation than tetraploid cultivars (Table 1). In environments with higher levels of stress (mainly, low soil fertility and summer drought), as occur in the soil and climatic conditions of Southern Chile, diploid cultivars, due to their stress tolerance=, were able to show advantages in herbage production, in relation to tetraploid cultivars. No significant differences were obtained in the annual average CP content. Nevertheless, tetraploid cultivars had a greater D value than diploid cultivars, except during the third year when the difference was not statistically significant. These results are in agreement with the morphological features of tetraploid cultivars, which have a higher cell content/cell wall ratio that confers a greater digestibility to the plant (O'Donovan, 2001).

Table 1 Herbage mass accumulation, D value and CP content, grazing preference, residual dry matter availability and pasture utilisation percentage of diploid and tetraploid *L. perenne* cultivars in Southern Chile

Year	*Herbage production* (ton DM/ha/year)		Crude protein (g/kg DM)		D value (% of the DM)		Grazing preference (Minutes/plot)		Residual Dry matter (kg DM/ha)		Utilisation efficiency (%)	
	D	T	D	T	D	T	D	T	D	T	D	T
1	12.9a	11.9 b	162 a	157 a	75.1 b	76.4 a	19,9 b	24,7 a	518 a	382 b	75,9 b	80,8 a
2	10.1a	8.9 b	164 a	168 a	72.9 b	74.2 a	20.4 a	26.1 b	382 a	285 b	68.9 a	74.0 b
3	9.9 a	8.8 b	200 a	202 a	76.9 a	77.9 a	27.0 a	29.0 a	224 a	168 b	89,2 b	91,0 a

D: diploid cultivars; T: tetraploid cultivars. Values in rows with different letter are different (P< 0.05)

Dairy cows grazed more time on tetraploid cultivars. Considering, additionally, the availability of residual dry matter after grazing (measured over 4 cm), and the percentage of pasture utilisation (over 4 cm), the diploid cultivars were less intensively grazed, suggesting a lower consumption by the cows.

Conclusions In the soil and climatic conditions of Southern Chile diploid cultivars of *Lolium perenne* showed greater herbage mass accumulation than tetraploid cultivars. Nevertheless, tetraploid cultivars showed higher D value and were more intensively grazed by dairy cows.

References

O'Donovan, M. (2001). The Influence of Grass Cultivars on Milk Production. http://www.teagasc.ie/research/reports/dairyproduction/4572/eopr-4572.htm.