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## Liveweight gain of lambs grazing six short-term ryegrass cultivars

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**Keywords:** liveweight gain, ryegrass, lambs

**Introduction** Increasing dry matter (DM) production per ha is a key goal in ryegrass (*Lolium*) breeding programmes (Easton *et al.*, 2002), based on the assumption that increased DM yield will in turn increase profitability per ha, through an increase in animal productivity. However, the performance of animals grazing pasture can also be modified by the quality of the forage on offer, and the presence of toxins within the pasture. The objective of this study was to compare the liveweight gain per hectare of lambs grazing six short-term ryegrasses, which had been selected for various combinations of improved DM production and nutritive value.

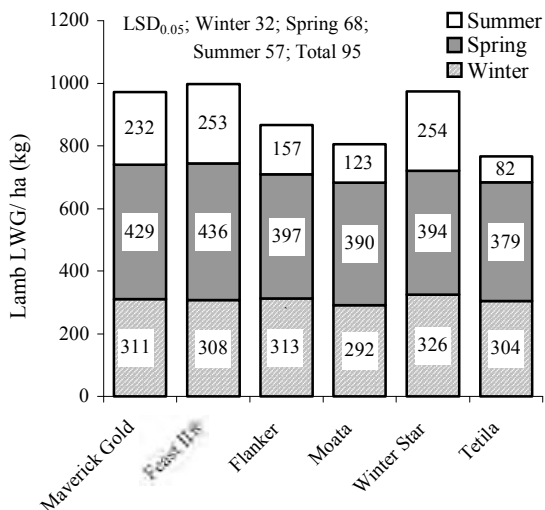
**Materials and methods** Thirty pure swards of six commercially available short-term ryegrass cultivars were sown in five replicates across three sites during Feb. 2000 in Canterbury, New Zealand. Each site consisted of 10 plots, with plots measuring 0.325, 0.425 and 0.45 ha, for sites 1, 2 and 3 respectively. Sowing rates were 18 kg/ha and 25 kg/ha for diploid and tetraploid cultivars respectively. Treatments were: tetraploid annual ryegrasses, cv. Winter Star and cv. Tetila (*Lolium multiflorum* var *westerwoldicum*); diploid Italian ryegrass cv. Flanker; tetraploid Italian ryegrasses cv. Moata and cv. Feast II (*L. multiflorum*); and the diploid hybrid ryegrass cv. Maverick Gold (*L. hybridum*). Treatments were stocked with Coopworth ewe lambs. Lambs were weighed before and after each grazing period. There were five grazing periods during the trial: winter 14 June 00 to 15 Aug. 00; spring 6 Oct. 00 to 13 Nov. 00 and 15 Nov. 00 to 11 Dec. 00; summer 14 Dec. 00 to 25 Jan 01 and 25 Jan. 01 to 20 Feb. 01. Base stocking rate for each grazing period was determined by the cultivar with the lowest pasture mass (assessed visually). A common post-grazing pasture mass was achieved across all cultivars by adding extra lambs to higher DM yielding plots. These lambs were recorded as extra grazing days, and added to weight gain per ha. The trial was irrigated, independently managed by AgResearch LTD, and all cultivars were coded to avoid bias.

**Results** Liveweight gain (LWG) per ha during each season is presented for each cultivar in Figure 1. Total LWG (kg/ha) for lambs grazing ryegrass cultivars Winter Star (974), Maverick Gold (971) and Feast II (997), was significantly greater ( $LSD_{0.05} = 94.8$ ) than those grazing Moata (805), Flanker (867) and Tetila (766). However, significant seasonal differences between cultivars only occurred during summer ( $P < 0.05$ ) and between Winter Star (326) and Moata (292) in winter ( $P < 0.05$ ).

**Discussion and conclusions** Annual ryegrasses: We suggest that improved LWG on Winter Star compared with Tetila during summer was due to a combination of improved forage quality (higher leaf/stem ratio) and improved persistence (more DM on offer). Italian/hybrid ryegrasses: Moata had the lowest DM production and persistence of this group (Easton *et al.* 2002), and these traits offer an explanation for the low overall LWG of this cultivar. Maverick Gold, Feast II and Flanker produce similar amounts of DM in Canterbury (M. Norriss pers. comm), and this is reflected in the winter and spring LWG results. Feast II and Maverick Gold have both been selected for improved leaf to stem ratio during summer and this was likely to contribute to the significantly higher LWG relative to Flanker during this period. Results support the hypothesis that both forage quantity and forage quality are important predictors of animal performance on grazed pastures.

### Reference

Easton, H.S., J.M. Amyes, N.E. Cameron, R.B. Green, G.A. Kerr, M.G. Norriss & A.V. Stewart (2002). Pasture plant breeding in New Zealand: where to from here? *New Zealand Grassland Association*, 64, 173-179.



**Figure 1** Liveweight gain of lambs grazing short-term ryegrasses