

Should we Select Cultivars to Suit Management?

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Pasture cultivars are commonly evaluated by assessing their yield after periodically cutting at specified intervals (usually 1 month) and height. This may or may not be similar to the grazing system under which the plants will subsequently be grown. However, the use of this evaluation technique is acceptable unless

there is a significant defoliation by cultivar interaction.

Methods

A glasshouse study was undertaken with individual potted plants using 9 cultivars of 2 ryegrass genotypes grown as a minisward, in order to examine the effects

Table 1. Growth of plants, tillers and roots of two cultivars of perennial ryegrass.

Cultivar	Group	Defoliation Frequency	Regrowth (g DM/plant)	Tiller		Root DM (g/plant)	Stubble WSC ¹ (mg/plant)
				No	Stubble Wt (mg/plant)		
LP31	1	IF	1.76	33	31	1.66	30
		F	0.24	18	16	0.39	2
KV	2	IF	1.02	25	30	0.76	9
		F	0.84	21	25	0.89	2

¹ Water-soluble carbohydrates

of defoliation. The cultivars were *Lolium multiflorum* cvs. Aristocrat and Tetilla, and *Lolium perenne* cvs. Pacific (P), Kangaroo Valley (KV), Yatsyn (Y), Ellett (E), NZA895, LP30, LP31 (the last 3 cultivars were experimental lines from Agriseed Ltd., New Zealand). Defoliation interval was Frequently (F), 3 times at 1 leaf per tiller or infrequently (IF), or once at 3 leaves per tiller (Fulkerson and Slack, 1994), and defoliation severity was 2, 5 or 12 cm stubble height. Treatments were imposed when the plants had reached 30 tillers per plant. The effect of defoliation was measured in terms of regrowth, tiller number and weight, root DM and water-soluble carbohydrates in stubble.

Results and Discussion

There was a significant difference in response to defoliation with the impact of severe to frequent defoliation being in the order *L. multiflorum* > Group 1 perennials (comprising E, NZA895, LP30 and LP31) > Group 2 perennials (comprising P, Y and KV). For

perennial ryegrass, the extremes within the 2 groups of cultivars are shown in Table 1.

The results indicate that a cultivar such as KV could be 'abused' in a grazing sense, with little effect on regrowth potential. On the other hand, a cultivar such as LP31 will produce more than KV under 'appropriate' defoliation conditions, though growth is severely suppressed by frequent and severe defoliation.

If the marked differential effect of defoliation on cultivars can be confirmed under field conditions, it provides strong argument for evaluating cultivars in relation to subsequent management system to be imposed. Field studies would also integrate the effects of defoliation with other environmental stresses.

Reference

Fulkerson, W.J. and K. Slack (1994). Leaf number as a criterion for determining defoliation time for *Lolium perenne*: Effect of water soluble carbohydrates and senescence. *Grass and Forage Science* (In press).