

The performance of cattle on lowland species-rich neutral grassland at three contrasting grazing pressures

B.A. Griffith and J.R.B. Tallwin

IGER North Wyke, Okehampton, Devon EX20 2SB UK, Email: jerry.tallowin@bbsrc.ac.uk

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Introduction Grazing is an essential management practice for maintaining the nature conservation value of lowland semi-natural neutral grassland to control succession and create different faunal habitats via structural heterogeneity within the pasture (Duffey *et al.*, 1974). However, there is a paucity of information on what would constitute a sustainable grazing intensity that will deliver the wildlife objectives and what the consequences of this management would be on growth rate of livestock and overall pasture output. An experiment was designed to quantify the ecological and agronomic consequences of imposing different grazing intensities on species-rich neutral grassland. The results will provide sward-based criteria for the integration of such species-rich grassland into commercial livestock systems.

Methods A randomised block experiment with three continuous grazing treatments, based on maintaining sward surface heights of 6-8cm (Severe), 8-10cm (Moderate) or 10-12cm (Lenient), using continental-cross beef heifers was imposed each year from 2000-2004 on species-rich grassland at a site in Somerset, England. The grassland comprised a mixture of *Lolium perenne-Cynosurus cristatus* (MG6) and *Centaurea nigra – Cynosurus cristatus* (MG5) grassland (Rodwell, 1992). A fourth treatment grazed to a surface sward height of 6-8 cm and receiving 130 kg N/ha per year was imposed on agriculturally improved land at the same site. This acted as a control and provided a means of comparison with a conventionally-managed beef system. Treatment targets were maintained by weekly adjustment of animals using a 'put and take' grazing system. Three 'Core' animals remained on each of the plots at all times. The following measurements were made: daily live-weight gain of the core animals, cumulative grazing day totals, weekly surface sward heights, herbage quality (by pluck sampling), sward canopy structure and botanical composition in 10 1m² fixed quadrats per paddock.

Results The species-rich grassland supported similar individual growth rates in the cattle to the fertilized control pasture (Table 1). Lower growth rates occurred on the severe compared with the lenient treatment on the species-rich grassland. The severe treatment carried significantly more live weight both per day and over the grazing season than the lenient and moderate treatments. The live weight carried was similar between the moderate and lenient treatments. There was no difference in live weight produced between the three grazing severities on the species-rich grassland. The fertilized pasture produced on average 91% more live weight over the grazing season than the species rich grassland.

Table 3 Animal performance: values represent means of the four experimental years

	Severe	Moderate	Lenient	Improved	s.e.d. (df = 3)	significance
LWG (kg/day)	0.73	0.81	0.92	0.86	0.044	$P < 0.001$
LW carried per day (t/ha)	1.09	0.94	0.85	1.82	0.044	$P < 0.001$
LW carried per season (t/ha)	184.8	147	129.3	315.1	10.64	$P < 0.001$
Output (kg/ha per year)	350.6	319.8	305.5	620.2	47.76	$P < 0.001$

Although canopy structure was affected by grazing pressure on the species-rich grassland, there was no significant overall change in botanical diversity, which remained at 16-18 plant species m², across treatments between 2000 and 2004.

Conclusion Under moderate to lenient grazing pressure predictable agronomic output and high individual animal growth rates can be achieved on lowland species-rich neutral grassland whilst maintaining the biodiversity interests – at least in the short term.

References

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