Effect of spraying pasture with fungicide on growth rates of grazing lambs in autumn and spring

T.C. REID

MAFTech, Kamo Agricultural Centre, Whangarei

D.R. LAUREN

MAFTech, Ruakura Agricultural Centre, Hamilton

ABSTRACT

Low growth rates in autumn have been described in cattle and sheep in New Zealand and overseas. Comparison of responses in liveweight gain to herbage allowance has shown that animals grazing in autumn grow much more slowly at all allowances than those grazing in spring.

When autumn- and spring-born lambs were grazed together, responses in liveweight gain to varying herbage allowance did not depend on their age and/or live weight. There were large differences between the responses of animals grazing in autumn and those grazing in spring.

In autumn, animals grazing pasture previously sprayed with high rates of fungicide at high allowances gained weight 28% faster than those grazing unsprayed pasture - 107.2 v 83.7 g/d.

In spring, the use of fungicide on pasture had no significant effect on liveweight gains of lambs.

Keywords Lambs; live weight; autumn; spring; seasonal difference; fungicide

INTRODUCTION

Poor growth rates in autumn have been observed in young cattle and sheep in New Zealand (Scott *et al.*, 1976; Reid, 1986; 1987) and overseas (Brewer *et al.*, 1971; Marsh, 1975; Ribeiro *et al.*, 1981). This poor animal performance has been attributed to differences in digestion and utilisation of energy and nitrogen (Ribeiro *et al.*, 1981; McRae *et al.*, 1985) or to the influence of fungi in the pasture (Brewer *et al.*, 1971). The difference in age of animals grazing in spring or in autumn is unlikely to explain the differences in liveweight gains in the two seasons according to Scott *et al.* (1976).

The trials reported here examine the effect of animal age (and/or live weight) and the use of high rates of fungicide on pastures on liveweight gains of lambs grazing in autumn or in spring.

MATERIALS AND METHODS

In all trials, the use of lambs born in autumn or in spring within the same flock (McQueen and Reid, 1988; Reid *et al.*, 1988) enabled comparisons of responses of animals of different ages (and hence live weights) grazing in autumn or in spring. The grazing trials were conducted in autumn and in spring of each of two years, with similar designs used in the two seasons of each year. On each occasion autumn- and spring-born animals (mainly ewes) were grazed together in groups. In two of the grazing periods, a small number of wethers were included. Grazing periods were for 6 to 8 weeks in April to June (autumn) or September to October (spring). The ages, numbers of lambs used and initial live weights of animals used in all four trial periods are given in Table 1. Spring-born animals grazing in autumn were approximately two months older and 6.4 to 7.4 kg heavier than autumn-born animals grazing in spring. All lambs were drenched at the start of each trial and fortnightly thereafter.

In Trial 1, animals were offered six herbage allowances between 1.1 and 6.7 kg green DM/hd/day in seven day breaks. Pregrazing herbage mass was 2.8 and 3.9 tonnes green DM/ha in autumn and in spring respectively.

In Trial 2, Fungicide (Thiophanate-Methyl) was sprayed onto pasture at 1 kg ai/ha two weeks before grazing. Herbage allowances (1.6 and 5.3 kg green DM/hd/day) of fungicide treated or untreated control pasture were offered in seven

TABLE 1 Age, number, sex and live weight of sheep used in each grazing trial.

		Autumn grazing		Spring grazing	
		Autumn-born	Spring-born	Autumn-born	Spring-born
Age at start of grazing period (months)		12	7	5	12
Number/group					
Trial 1	ewes	12	8	8	8
	wethers	0	4	4	0
Trial 2	ewes	8	8	8	4
	wethers	0	2	0	0
Initial live weight (kg)					
Trial 1	ewes	38.7	28.9	22.1	37.6
	wethers	-	30.3	24.3	-
Trial 2	ewes	42.5	32.7	25.3	43.9
	wethers	-	35.0	-	-

day breaks. There were three replicates. Pregrazing herbage mass was 3.9 and 4.0 tonnes green DM/ha in autumn and spring respectively.

RESULTS AND DISCUSSION

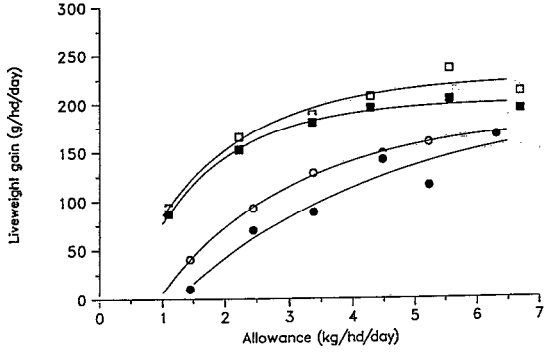

FIG. 1 Relationships between liveweight gain and allowance of green herbage for autumn- (■,●) and spring- (□,○) born lambs grazing in autumn (●,○) or spring (■,□) (Trial 1).

The differences observed between liveweight gains in autumn and those in spring, were less in the two trials reported here than those observed in a previous experiment (Reid, 1987). In Trial 1, liveweight gains in autumn (up to 169 g/d) (Fig 1), were considerably higher than reported earlier, (Reid, 1987) or those observed in Trial 2 (approximately 100 g/d at high allowance) (Table 2). Liveweight gains in spring for Trial 1 were similar to those in the earlier report (up to approximately 200 g/d), while those in Trial 2 were only 121 g/d at the high allowances. The reasons for these differences between trials are not known.

TABLE 2 Liveweight gains of lambs grazing at two herbage allowances in autumn and in spring (Trial 2).

	Herbage allowance (kg GDM/hd/d)	Liveweight gain (g/d)
Autumn grazing	5.3	95.5
	1.6	1.7
SED		4.12
Spring grazing	5.3	121.4
	1.6	58.2
SED		5.62

In Trial 1, differences between autumn and spring grazing were even greater at low allowances than at high (Fig 1). In both seasons, spring-born animals gained liveweight faster than those born in autumn at all allowances. In spite of these differences, autumn- and spring-born animals responded to herbage allowance in a similar manner in each grazing season. Thus the differences observed in this and earlier trials between response curves in autumn and those in spring did not result from differences in age and/or live weight of the animals.

In Trial 2, liveweight gains of spring-born animals were again greater than of those born in

TABLE 3 Liveweight gains (g/d) in autumn and spring of lambs grazed at two herbage allowances (1.6 and 5.3 kg GDM/hd/day) on unsprayed pasture and pasture sprayed with fungicide (Trial 2).

Grazing season	Allowance (kg GDM/hd/day)	Fungicide	Control	SED
Autumn	5.3	107.2	83.7	5.82
	1.6	3.7	-0.3	
Spring	5.3	130.5	112.3	7.94
	1.6	59.3	57.1	

autumn at both allowances and in both grazing seasons. As neither season nor sex influenced the responses to either herbage allowance or fungicide use in either grazing season, only main effects of herbage allowance and fungicide are presented. As expected from results of earlier trials, there were large differences in liveweight gains between high and low allowance (Table 2).

The use of fungicide spray on pasture increased liveweight gains by 28% (23.5 g/day) at the high allowance in autumn and resulted in a small increase at the low allowance where the animal growth appeared to be restricted mainly by lack of feed (Table 3). In spring, differences between liveweight gain on sprayed and unsprayed pasture were not significant. Thus, use of heavy dressings of fungicide on pasture can increase growth rate of lambs in autumn, but not in spring. Further, the autumn effect is likely to occur only when there is sufficient pasture offered.

Large differences were recorded between liveweight gains in autumn and in spring in both years in this work and in earlier work (Reid, 1986; 1987). The results reported here show that these differences did not result from differences in age and/or live weight of animals grazing in different seasons. MacRae *et al.* (1985) indicated that differences in absorption and utilisation of amino acid and in energy balance are important in determining relative production in autumn and in spring. Spraying with heavy rates of fungicide increased liveweight gains of animals grazing in autumn when there was sufficient pasture on offer. However, liveweight gains were still considerably less than those obtained in spring. Fungicide spraying of pasture in spring did not affect liveweight gain. These results support the notion that fungi present in the pasture might also be affecting liveweight gains in autumn, a phenomenon described by Brewer *et al.* (1971). Fungi capable of producing a range of toxins have been isolated from pasture collected at Pukekohe and other regions (Lauren *et al.*, 1988 and unpublished information). Preliminary examination of pasture samples from Trial 2 for tricothecene mycotoxins has so far failed to reveal their presence, but further work is needed on this aspect.

ACKNOWLEDGEMENTS

The technical assistance of Mrs L.D. Wilson and Messrs A.C. Monigatti, A.M. Templeman, A. Feringa and D.E. McNaughton are gratefully acknowledged as is the assistance of Dr J.E. Waller with biometrical analysis.

REFERENCES

Brewer D.; Calder F.W.; MacIntyre T.M.; Taylor A. 1971. Ovine ill-thrift in Nova Scotia.I. The possible regulation of the rumen flora in sheep by the fungal flora of permanent pasture. *Journal of agricultural science, Cambridge* **76**:465-477.

Lauren D.R.; DiMenna M.E.; Greenhalgh R.; Miller J.D.; Neish G.A.; Burgess L.W. 1988. Toxin-producing potential of some *Fusarium* species from a New Zealand pasture. *New Zealand journal of agricultural research* **31**:219-225.

Marsh R. 1975. A comparison between spring and autumn pasture for beef cattle at equal grazing pressure. *Journal of the British Grasslands Society* **30**:165-170.

McQueen I.P.M.; Reid T.C. 1988. The development of an autumn lambing flock of Dorset x Romney ewes without the use of hormones. *Proceedings of the New Zealand Society of Animal Production* **48**:87-90.

MacRae J.C.; Smith J.S.; Dewey P.J.S.; Brewer A.C.; Brown D.S.; Walker A. 1985. The efficiency of utilization of metabolizable energy and apparent absorption of amino acids in sheep given spring and autumn- harvested dried grass. *British journal of nutrition* **54**:197-209.

Reid T.C. 1986. Comparison of autumn/winter with spring pasture for growing beef cattle. *Proceedings of the New Zealand Society of Animal Production* **46**:145-147.

Reid T.C. 1987. Nutrition of autumn-born lambs. *Proceedings of the Nutrition Society of New Zealand* **12**:124-126.

Reid T.C.; Sumner R.M.W.; Wilson L.D. 1988. Performance parameters in an autumn lambing ewe flock. *Proceedings of the New Zealand Society of Animal Production* **48**:91-94.

Ribeiro J.M.C.R.; MacRae J.C.; Webster A.J.F. 1981. An attempt to explain differences in the nutritive value of spring and autumn harvested dried grass. *Proceedings of the Nutrition Society* **40**:12A.

Scott J.D.J.; Rattray P.V.; Smeaton D.C. 1976. Environmental factors associated with summer-autumn growth rates of cattle and sheep. *Proceedings of the New Zealand Society of Animal Production* **36**:103- 119.