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TALL FESCUE FOR FINISHING LAMBS AND FLUSHING EWES IN HAWKES BAY

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Abstract

Because of the many problems experienced in Hawkes Bay with traditional ryegrass pastures — drought, grass grub, stem weevil, ryegrass staggers — a research programme to evaluate tall fescue was initiated. Four short term trials have compared the nutritive value for sheep of two tall fescue cultivars (Roa and Demeter) with Nui ryegrass, all sown with white clover.

All pasture types had similar quality for finishing lambs, although regrowth after a silage cut was better than previously grazed pastures, especially for Nui.

In the droughts of 1982 and 1983, tall fescue pastures were superior to those of Nui in both quantity and quality of feed for ewes prior to mating. This advantage resulted in an average of 18 more lambs being born per 100 ewes mated.

Provided it persists, continues to produce well, and does not cause serious animal health problems under intensive sheep grazing, these results show that tall fescue should have an important role to play in Hawkes Bay and similar environments.

Keywords: tall fescue, perennial ryegrass, lamb production, ewe production.

INTRODUCTION

Tall fescue (*Festuca arundinacea* Schreb.) is widely used in the U.S.A. as a forage, mainly for cattle. It is favoured because of its adaptation to a wide range of soil conditions, high productivity, persistence, responsiveness to fertilisers, and ease of management. Its limitations are low palatability and toxicity problems (van Keuren & Stuedemann 1979). New Zealand research has shown the superiority of cultivars Aberystwyth S170 and 'Grasslands Roa' over ryegrass (*Lolium perenne* L.) cultivars in terms of pasture production during dry seasons (Watkin 1975; Kain *et al*, 1979; Goold & van der Elst, 1980; Anderson *et al*, 1982; Brock, 1982). No evidence of toxicity in improved cultivars has been recorded in New Zealand to date.

There are many problems in using traditional ryegrass pastures in Hawkes Bay — particularly drought, grass grub, Argentine stem weevil and ryegrass staggers. Tall fescue cultivars have shown production advantages over ryegrass cultivars, in small plot cutting trials in Hawkes Bay, and these have been ascribed to greater tolerance to drought and grass grub (Kain *et al.,* 1979) and possibly to Argentine stem weevil. There was a need to see if this dry season advantage would result in higher lambing percentages via better premating feeding of ewes.

It was also considered necessary to evaluate tall fescue as a quality feed for finishing lambs, since it has been reported as being of poorer quality than ryegrass, particularly in spring when reproductive growth is occurring (Reid *et al,* 1978, Davies & Morgan, 1982). With marked responses having been recorded from feeding silage to ewes prior to mating in the Hawkes Bay (Wright *et al,* unpubl.) and elsewhere (Rattray et al., 1979; Hayman & Munro 1983), it was decided to assess the quality of

regrowth after silage cutting by measuring any resultant improvements in lamb growth.

METHODS

Four short term trials were conducted at the Takapau Research Station on a free draining Takapau silt loam. The pastures compared in all trials were 'Grasslands Roa' tall fescue, bred for increased herbage production and acceptability to animals (Anderson, 1982); 'Demeter' tall fescue, a well performed South Australian cultivar (Gibson, 1978); and 'Grasslands Nui' ryegrass; all sown with 'Grasslands Pitau' white clover (*Trifolium repens*) in 1980. Eight replicate paddocks of 0.2 ha were used.

Trial L1 evaluated the quality of the pastures for finishing lambs over six weeks in Nov-Dee 1981. Five intended pasture allowances were used (0.9, 1.4, 2.1, 3.0, 5.0 kg/lamb/day).

Trial L2 investigated pasture quality for finishing lambs over six weeks in Nov-Dec 1982 on two intended allowances (1.2, 3.0 kg/lamb/day) of the three pastures which had been either previously grazed or regrown from a silage cut.

Trials El and E2 compared the three pastures as premating feeds for ewes stocked at equal densities. In these trials any differences in lambing percentages could be attributed in unknown proportions to variations in both pasture production and quality. The data relate to a 33 day feeding period in Feb-March 1982 (El) and to 41 days in Feb-April 1983 (E2).

Pasture measurements included ground level cuts for estimation of pre- and post-grazing herbage mass and net pasture growth. Samples were dissected to estimate the percentages of each of the main pasture species and of green material. Lamb liveweights (fasted) and carcass weights, ewe liveweights (fasted) and lambs born were recorded.

Table 1: TRIAL CONDITIONS

Trial	L1	L 2	El	E2
Pregrazing means				
Herbage Mass (t/ha)	3.2	2.7	1.8	1.4
% Sown grass	52	63	49	48
% Clover	26	9	2	1
% Green Material	81	75	52	50
Grazing Duration (days)	5	5	3	7
Target No. of sheep per group	12'	12'	30	45
Mean Inital Liveweight (Fasted) (kg)	23.8	27.7	51.1	47.2
Rainfall (mm) (Nov-Dee)	124	95		
		164[2]		
(Jan-Mar)			173	91
				250[2]

[1] These were not always achieved on all replicate paddocks at all allowances.
[2] 16 year means, 1968-84.

RESULTS AND DISCUSSION

Rainfall, mean pregrazing sward characteristics, grazing durations, and initial liveweights for each trial are given in Table 1. Mean liveweight gains (LWG) and hot carcass weights (CW) for experiments L1 and L2, are given in Fig. 1 and Table 2 respectively. In Fig. 1 curves of the form LWG or CW = a-b/allowance have been

fitted to group means. The x-axis represents 'measured' allowance as opposed to the 'intended' allowances mentioned in the Methods section.

The lamb trial results are summarised as follows:

* per lamb production and hence monetary returns had the usual asymptotic relationship with pasture allowance.
* there were no differences between pasture types ($P>0.05$)
* regrowth from silage cuts was of higher quality, as determined by lamb growth rates, than laxly grazed pastures. This was especially true for Nui pastures (Pastures x Regrowth interaction $P<0.01$). However, a depression in the rate of growth following silage cuts was observed for all cultivars compared to the growth rate of grazed pastures.

Table 2: TRIAL L2 LIVEWEIGHT GAINS AND CARCASS WEIGHTS

	Liveweight gains (g/lamb/day)				Carcass weights (kg/lamb)			
Allowance (kg/lamb/day)	1.2		3.0		1.2		3.0	
Regrowth	Silage	Grazed	Silage	Grazed	Silage	Grazed	Silage	Grazed
Nui	76	-22	142	75	14.8	13.4	16.1	14.8
Roa	61	11	121	83	13.4	13.4	14.8	14.8
Demeter	57	18	127	112	13.1	13.0	14.4	13.5
SE. Mean		19.0				N.A.		

N.A. Not available as individual weights not given on killing sheets.

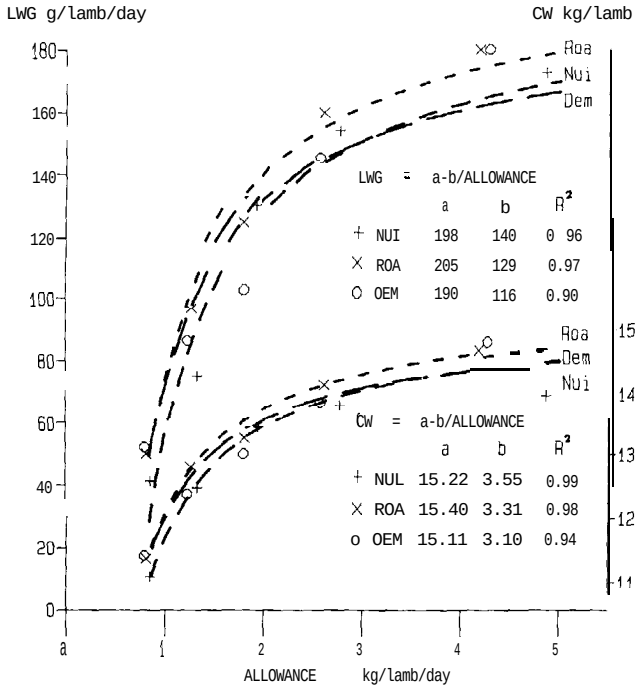

Figure 1: Liveweight gain (LWG) and carcass weight (CW) relationships *with* pasture *allowance in Trial L1.*

Table 3: PREGRAZING GREEN HERBAGE MASS (t/ha), PREGRAZING GREEN PERCENT, LIVEWEIGHT CHANGES (g/day), AND LAMBS BORN PER EWE MATED (LB/EM) IN TRIALS El AND E2.

Trial	El (Mating Started 1213)				E2 (Mating Started 2513)			
	Pregrar. green	Green %	LWG (19/2—2413)	LB/EM	Pregraz. green	Green %	LWG' (23/2—5/4)	LB/EM
Nui	0.60	45	-113	1.23	0.59	37	-9	1.15
Roa	1.03	53	-12	1.33	0.67	53	+89	1.40
Demeter	1.21	54	-17	1.40	0.70	53	+ 101	1.36
S.E. Mean			14				12	

[1] An estimated gut fill of 2 kg has been subtracted from the weights of 5/4/83 which were not fasted weights.

Lamb growth rates of approximately 180 g/day at high allowances are similar to those found by other researchers (Jagusch et *al,* 1979) although they are lower than those often obtained on well managed farms (Rhodes, pers. comm.). Table 3 gives mean pregrazing green herbage masses, pregrazing green percentages, liveweight changes and lambs born/ewes mated for trials El and E2.

During the particularly dry Jan-Mar periods of 1982 and 1983 (fifth least and least rainfall of 16 years resp.) the differences in rates of change of liveweight between the ewes grazing ryegrass and tall fescue pastures were approximately 100 g/day in both years. These liveweight responses resulted in approximately 13 and 23 extra lambs born per 100 ewes mated in 1982 and 1983 respectively. Although the higher proportion of multiple births was not statistically significant ($P>0.05$), it was of a size that could be expected by relating ovulation rate to liveweight and liveweight change (Smeaton et a/, 1982), taking a 28% failure of multiple ovulations into account (Kelly & Knight, 1981).

In the dry conditions that prevailed before and during trials El and E2, much of the ryegrass leaf material became dessicated. On the other hand, tall fescue displayed an effective survival technique, rolling its leaves to reduce evapotranspiration. This ability to withstand moisture stress enabled it to survive the drought better than ryegrass. Immediately after rain, the leaves unfurled giving a colour response and an illusion of 'instant' dry matter. Better production as a drought approaches, together with this remarkable recovery following rain, reduces the effect of dry periods. Besides the probable benefits described here in increased lambing percentages, faster hogget growth and wool growth would presumably result from the better feeding offered by tall fescue during the months of maximum wool growth rates (Hawker, 1984).

Longer term productivity and persistence of these tall fescue cultivars under an intensive ewe and lamb farmlet system are being studied at Takapau. Their tolerance to Argentine stem weevil (observed to be higher than for Nui) and possible animal health problems such as 'ryegrass staggers' (Mortimer et *al,* 1984) and 'fescue foot' (Simpson, 1975) will be investigated.

Current drawbacks for the widespread acceptance of these tall fescue cultivars are slow establishment (Brock et al, 1982) and the high cost of seed.

Short term trials have shown that Roa and Demeter tall fescue are similar to Nui ryegrass in terms of pasture quality for finishing lambs and, due to greater tolerance of drought and pests, are superior in production and quality for feeding ewes prior to mating. Tall fescue should have an important role to play for sheep farmers in the Hawkes Bay and similar environments.

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REFERENCES

Anderson, L.B. 1982. *N.Z. J. exp. Agric. 10: 269-273.*

_____; Brock. J.L.; Boyd, A.F.; Harris, A.J.; Ryan, D.L. 1982. *Ibid: 275280.*

Brock, J.L. 1982. *Ibid:* 281-284.

_____; Anderson, L.B.; Lancashire, J.A. 1982. */bid: 285-289.*

Davies, D.A.; Morgan, T.E.H. 1982. *J. Agric. Sc., Camb. 99:* 153-161.

Gibson, P.R. 1978. *Proc. Aust. Soc. Anim. Prod. 12: 206.*

Goold, G.J.; Hupkens van der Elst, F.C.C. 1980. *Proc. N.Z. Grass/d. Ass. 47:* 130-137.

Hayman, J.M.; Munro, J.M. 1983. */bid 44:* 196-202.

Hawker, H. 1984. Aglink FPP 326.

Jagusch, K.T.; Rattray, P.V.; Winn, G.W. 1979. *Proc. Agron. Soc. N.Z. 9:* 7-10.

Kain, W.M.; Slay, M.W.; Atkinson, D.S. 1979. *Proc. N.Z. Weed & Pest Cont. Cont. 32:* 86-91.

Kelly, R.W.; Knight, T.W. 1981. *Aglink FPP 299.*

Mortimer, P.H.; Young, P.W.; di Menna, M.E. 1984. *Proc. N.Z. Soc.* Anim. Prod. 44: In press.

Rattray, P.V.; Jagusch, K.T.; Smith, J.F.; Winn, G.W.; Farquhar, P.A. 1979. *Proc. N.Z. Grassld Ass. 41:* 63-71.

Reid, R.L.; Powell, K.; Balasko, J.A.; McCormick, *C.C.* 1978. *J. Anim. Sc. 46:* 1493-1502.

Simpson, B.H. 1975. N.Z. *vet. J. 23:* 182.

Smeaton, D.C.; Webby, R.W.; Hockey, H-U.P.; Wadams, T.K. 1982. *Proc. N.Z. Soc. Anim. Prod. 42: 37-39.*

van Keuren, R.W.; Stuedemann, J.A. 1979. *In:* "Tall Fescue", ed. Buckner, R.C. & Bush, L.P., Lexington, Kentucky, U.S.A.

Watkin, B.R. 1975. *Proc. N.Z. Grass/d Ass. 36 (2):* 180-190.