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MANAGING THE TRANSITION TO OUT-OF-SEASON LAMBING — A CASE FARM EXAMPLE

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Abstract

A spreadsheet teed budgeting model and gross margin analysis were used to plan an out-of-season lambing system for a Manawatu sheep farm. Of the systems investigated, a 30% winter lambing option was predicted to be the optimum for pattern of pasture cover and returns.

Poor sheep performance in the first season of winter lambing (1988) reduced winter stocking rate by 20% and spread lambing dates to reduce peak spring teed demand for the second season. Total income in 1987 was estimated to be $8284 lower than it the traditional lambing policy had been maintained, mainly because higher returns for early-season lambs were insufficient to compensate for production losses resulting from reductions in sheep numbers wintered.

The transition to winter lambing required major changes to winter grazing management, increased expenditure on animal health and meant that two tooths entering the early lambing flock had to be grown taster. Regular monitoring of pastures and animal performance was an important component in developing the new farming system.

Keywords: spreadsheet modelling, teed budgeting. transition management, out-of-season lambing.

INTRODUCTION

The advantages of out-of-season lambing to the New Zealand meat industry have been widely publicised in the popular farming press. This has been supported by field trials, mainly in the northern regions of New Zealand, which have identified the technology necessary to obtain acceptable levels of ewe and lamb performance from alternative out-of-season lambing systems (Andrewes 8 Taylor 1986; Lowe *et al.* 1988).

However, little research has been done on how farmers can successfully manage a transition from traditional spring lambing to out-of-season lambing. Such a change will, depending on the proportion of the flock involved, affect pasture and flock management, cash flow, and capital outlay. This paper reports how an out-of-season lambing system was planned and implemented on a Manawatu sheep farm and discusses the effect of this change on the farm's physical and financial performance.

BACKGROUND AND METHODS

Experimental farm

Massey University's Keeble Farm comprises 219 ha of rolling terraces and river flats. Before the adoption of winter lambing in 1986, 2700 ewes, 600 flock replacements and 100 Friesian bulls were wintered (16.3 su/ha). Lambing averaged 115-120%, with prime lambs and 18 to 20 month bulls slaughtered at carcass weights of 13 kg and 250 kg respectively. Annual pasture production averages 10 168 kg DM/ha (Table 1). Summer pasture growth is usually reliable but daily winter growth rates decline to 13 kg DM/ha during July. Pastures are rotationally grazed except for set stocking from lambing to weaning.

Table 1: Pasture growth rates and ewe feed intakes used in modelling exercises

Month	Pasture[1] (kg DM/ha/d)	Spring Lambing ewe[2] (kg DM/ewe/d)	Winter Lambing ewe[2] (kg DM/ewe/d)
July	13	1.3	3.3
August	20	1.6	2.9
September	33	2.6	0.9
October	45	2.9	1.0
November	50	2.6	1.3
December	40	1.4	1.6
January	30	1.4	1.6
February	23	1.2	1.2
March	26	1.2	1.1
April	21	1.6	1.2
May	20	1.2	1.4
June	13	1.2	3.0
Annual Total	10166	615	626

[1] Collected on Keeble Farm from 1981-87.
[2] Feed intakes derived by Brookes & Barry (1986).

The farm is intensively monitored to provide data for management decisions. Pastures in each paddock are measured fortnightly with a rising plate meter (Earle 8 McGowan 1979). Pasture growth rates are estimated indirectly from this information (Gray 1988). Lambs and hoggets are weighed monthly and ewes every 6-8 weeks (n=50-1 00/class) and ewes are condition scored (CS) (Jefferies 1961). Lamb liveweights are recorded at birth, docking, weaning and sale. Fleeceweights are recorded at shearing (n=50/class).

Feed budget simulation models

Initial evaluation of out-of-season lambing was completed during 1985 using a simple spreadsheet feed budgeting model (Gray 8 Lockhart 1985). This model matched predicted feed demand with feed supply. The resultant average farm pasture cover was manipulated to lie within 1000-2000 kg DM/ha throughout the year by a combination of adjusting stocking rates, animal feed intakes, stock sales, rates of liveweight gain, and the use of feed conservation and the feeding of supplements.

Subsequent modifications to the model reduced data inputs and enabled rapid assessment of alternative lambing dates. The revised model also provided the grade distribution of lambs sold and the number of lambs that could be retained to meet the heavyweight chilled lamb market. Stock sales and purchases were linked directly from the feed budget to a gross margin (GM) template. Thus, by entering a single opening number of ewes (on 1 July), the proportion of early-lambing ewes, lambing percentages and dates, the model generated monthly farm pasture cover, lamb sales and the GM ($/ha and $/SU) for the next 12 months. A range of financial indices, such as the average lamb price and expenditure on animal health and shearing, were also produced and the effects of varying input costs and product prices could be evaluated by parametric tables incorporated in the model.

The out-of-season lambing options modelled in 1985/86 were traditional spring lambing, all autumn lambing, and winter lambing of 30% or 35% of the flock Each option included a fixed cattle policy of 100 spring and 25 autumn-born bull calves.

Out-of-season lambing trial

In January 1986, 200 mixed age (MA) Border Leicester Romney cross ewes exceeding 60 kg liveweight were progesterone-primed with CIDRs (controlled internal drug release devices) and mated with Suffolk rams (10% ram:ewe ratio) from 27 January. Lambing began on 20 June and continued for 48 days. The normal lambing flock of 2364 ewes lambed from 5 August. In 1987 the out-of-season flock was increased to 600 ewes (300 MA and 300 two tooths) and the early lambing date was brought forward to 1 June.

RESULTS

The effects of the four lambing options on pasture cover projected from the model are presented in Fig. 1. These demonstrated that out-of-season lambing would significantly change the pattern of feed demand, especially during winter. The 30% winter lambing option, which provided an acceptable pattern of pasture cover and generated the highest GM ($349/ha) of the out-of-season options modelled, was selected and implemented in 1986.

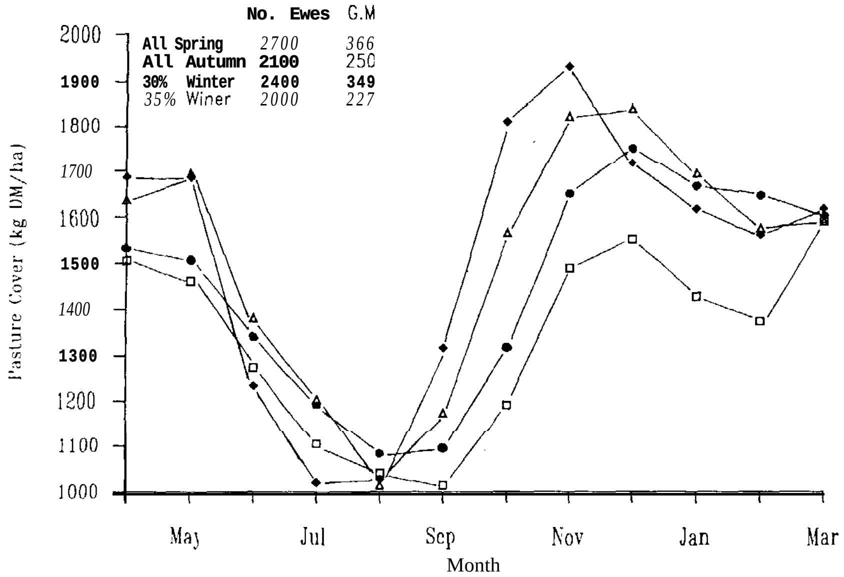

Figure 1. Annual patterns of average pasture cover for the four lambing options. All spring (0-D). all autumn (● ●), 30% winter (● ●) and 35% winter (Δ Δ) lambing. Respective gross margins ($/ha) are shown at 1985/86 costs and prices.

The greater profitability of the all-spring lambing option indicated that the premiums paid for early-season lambs were still insufficient to compensate for the expected decrease in wool production and fewer lambs sold with the out-of-season' options.

The actual pasture cover recorded in 1986 (Fig. 2) was substantially different from that predicted. Sheep liveweights reflected these conditions of feed supply. The early-lambing ewes, which docked 99% lambs, maintained their liveweight through winter and spring and their offspring grew at an average of 216 g/day (ADG) to reach 27.5 kg at weaning. In contrast the spring-lambing ewes lost 2 kg over winter to lamb down at 57 kg. Low ewe body condition (CS=2.7) combined with poor lambing weather and inadequate feeding (791 kg DM/ha pasture cover at lambing) resulted in a final lambing of 88% for the spring flock Spring-born lambs weighed 28.4 kg at weaning (ADG=251 g/day). Net income during the 1986187 season with winter lambing was estimated to be $3650 less than if traditional spring lambing had been continued.

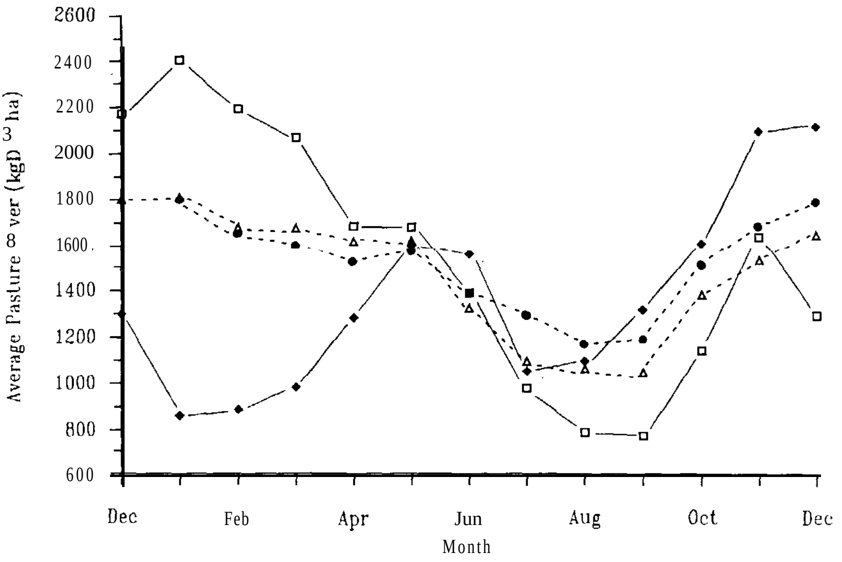

Figure 2: predicted (● - ●, 1986; △ - △, 1967) and actual □ — □, 1966; ◆ — ◆ 1967) average farm pasture cover.

These results, after allowing for lower than average seasonal pasture production, indicated that the feed requirements of the early-lambing ewes had been underestimated, and that the proximity of the lambing dates of the two flocks had created an excessively high early-spring feed demand. The 1987 management was modified using feed budgeting to correct these shortcomings. Ewe numbers wintered were reduced by 400 (Table 2). Summer drought subsequently required a further reduction of 250 ewes to maintain the liveweights of capital stock. Spring lambing was delayed to 1 September, because the model indicated that with 30% winter lambing (1 June) 700 kg of nitrogen (N) at a 15:1 (kg DM:N) response was required to meet the deficit in pasture production for each week the lambing date of the spring flock was advanced during August.

Table 2: Stock numbers wintered and sheep performance prior to and following adoption of winter lambing

	Before winter lambing	1966	1987[3]
Stock numbers wintered:			
Spring lambing ewes	2700	2364	1300
Winter lambing ewes	–	200	600
Ewe hoggets	600	635	430
Bulls R1yr	102	93	106
1-2 yr (autumn)	–	19	20
R2 yr (autumn)	–	–	22
Stocking rate (su/eff.ha)[1]	16.3	16.7	16.3
Lambing performance[2]:			
Spring (%)	120	88	120
Winter (%)	–	99	90
Wool Production (kg)	16,713	11,212	10,539

[1] Spring lambing ewes 1.0 su, winter lambing ewes 2.0 su.
[2] (lambs tailed/ewes mated) x 100
[3] Sheep numbers reduced by 250 ewes and 205 ewe hoggets because of drought.

The 1987 pattern of pasture cover (Fig. 2) and livestock performance reflected these adjustments. The overall lambing increased to 113% (Table 2). Winter-born lambs grew at 225 g/day to reach 27.1 kg at weaning in late September, and 21 WX ram lambs had been drafted by mid-November at an average carcass weight of 20 kg. Their later-born counterparts weighed 28.0 kg at weaning on 18 December (ADG=242 g/day).

The 1987 cash flow shows that the out-of-season lambing reduced the annual cost of current account interest by $286 and generated a surplus of $37 553, some $6264 less than that predicted for the traditional spring system if it had been maintained. Thus, while the out-of-season policy lamb returns were higher ($19.50/ lamb versus $14/lamb), total wool production was reduced by 2670 kg because fewer sheep were wintered (Table 2). The sensitivity of 30% winter lambing to changes to wool and lamb prices is presented in Table 3, which indicates that a 10.5% improvement in sheep meat prices relative to wool would give each option the same cash surplus.

Table 3. Effect of varying lamb and wool prices on the gross margin ($/ha) for winter lambing

Average net lamb puce	Wool returns (c/kg net)				
	340	360	380	400	420
$15	266	280	291	303	315
$17	289	300	312	324	335
$19	315	326	338[a]	350	362
$21	330	342	354	365	377
$23	351	363	375	386	396

[a] The 1986/87 GM/ha for 30% winter lambing is highlighted.

DISCUSSION

The transition from normal spring to 30% winter lambing at Keeble Farm was completed over 2 years. Initial planning by feed budgets provided an indication of the likely effect of alternative lambing systems in an average year, but the actual outcome in 1986 indicated that some of the initial input assumptions for feed requirements (and hence stocking rate and lambing dates) were incorrect. The management system had to be revised accordingly.

The routine collection of pasture and animal performance data was valuable during the transition period. It provided input data for the feed budget models and enabled the accuracy of predictions to be checked. This enabled plans to be adjusted in both a rational and timely manner. The poor result for the first season of winter lambing reflects the difficult climatic conditions, but also indicates that management responded inappropriately to the information collected.

Major adjustments had to be made to pasture management to ensure continuity of feed supply for the winter-lambing ewes. Lambing in spring coincides with increasing pasture growth rate and the emphasis of grazing management is on controlling pastures to maintain quality — normally by set stocking and conservation. With winter lambing the increased feed requirements of the ewe coincide with declining pasture growth. Management emphasis is switched to controlling animal feed intakes to ensure adequate feed reserves for the spring lambing flock, without prejudicing the growth of winter-born lambs. In addition, planning of pastures for winter must now start 6-8 weeks earlier (1 January) to allow time for the 1 May target of 1600 kg/DM/ha to be accumulated. Feed budgets during this period indicate when lambs should be sold, the levels of ewe intake that can be sustained and whether the use of silage or nitrogen is necessary, No problems have resulted from the reduced winter stocking rate in controlling late spring pasture growth because of the increasing feed requirement of the winter-born lambs and the high feed intake by bulls.

Winter lambing MA ewes easily reached their required mating liveweight of 55-60 kg by January because they were weaned on to plentiful supplies of high quality spring pasture. However, maiden two tooths entering the flock had to reach this weight 3 months earlier than under the normal lambing system. A clear management priority for feeding flock replacements was therefore required to avoid conflict with the finishing of prime lambs for sale (the more immediate source of income).

Utilisation of labour improved with winter lambing through a spread of seasonal work requirements and also because fewer sheep were wintered under the new system. However, more time to complete stock movements was required because of the additional classes of sheep, particularly during winter.

Out-of-season lambing may increase the inputs necessary to control internal parasites in the flock because susceptible lambs are on the property for most of the year. In particular, the weaning of winter-born lambs in late September-October corresponds to the normal spring rise of infective nematode larvae on pasture (Familton 1983). The opportunities to use an integrated approach to parasite control through cattle and the spelling of pastures are limited because of the additional classes of sheep requiring separate grazing management. A drenching programme based on the results of faecal egg counts at 3 to 6-weekly intervals (depending on the class of sheep) has therefore been developed to support the five-drench post-weaning preventive programme (McKenna 1981; Brunsden 1982). The cattle:sheep ratio has been increased, partly as a means of improving sheep health, but also because of the higher profitability of bull beef and the wider range in feed demand that they provide to combat fluctuations in feed supply (Journeaux et al. 1987).

CONCLUSIONS

The introduction of an out-of-season lambing policy is a major management task that requires careful planning and a willingness on the part of the farmer to make significant adjustments to existing farming practices. For this reason an initial pilot trial with 5-10% of the flock to gain experience with the technology and the different management requirements of out-of-season lambing is recommended. Regular monitoring of pastures and animal liveweights will provide the farmer with an accurate appreciation of the effect of a larger scale change and will at the same time provide information which can be used to plan any adjustments that may be required.

Out-of-season lambing will be adopted by few farmers in regions with relatively low winter pasture growth rates because current premiums ($6-8/lamb – 1986/87 season) for early-season lambs are insufficient to compensate for production losses resulting from the lower stock numbers wintered, especially if wool prices are high relative to sheep meat prices. Farmers who are considering out-of-season lambing should also evaluate the opportunities offered by alternative livestock systems such as bull beef and deer, as well as the potential to increase production from the existing sheep system, before making a decision to proceed.

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