

PASTURE UTILIZATION BY SHEEP AND CATTLE

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INTRODUCTION

I FARM 145 ha in partnership with my father at Brydone, which is 21 km south of Gore. The farm is flat and is on three levels. One-third of the area, containing *Edendale* soils, is situated on a terrace 20 m above the flood plain of the *Mataura* River. The remaining area below the terrace consists of *Mataura* soils, apart from some 12 ha of sands and gravels. The fertility of this small area has been built up by heavy winter stocking to enable pasture and lucerne to be established successfully. The *Edendale* soil, which is developed on deep deposits of windborne material, is the heavier of the two soils, with 18 to 20 cm of topsoil. Gravels occur at about 4 m. The *Mataura* soils, developed on alluvium, are of variable texture, and gravels may occur at a shallow depth. Both soils are free-draining, but during a dry period, as experienced last summer, the superior moisture-retention properties of the *Edendale* soils are apparent.

Annual rainfall approximates 960 mm and is usually well distributed. Frosts to -10°C can be expected between May and September. I consider winter to last 90 to 100 days.

The property is subdivided into 20 paddocks ranging in size from 1.5 to 8 ha. Stock in each paddock has access to water, and the whole farm is reticulated with a wire from a mains electric fence controller. The 8-ha paddocks are too large for maximum pasture utilization unless they are stocked with all the ewe flock, and although it is planned to subdivide them permanently, a temporary electric fence is used at present.

Stock numbers and performance are presented in Table 1.

PASTURES

Pastures are predominantly perennial ryegrass and white clover. Some have not been renewed since the property was purchased in 1950, although before rotational grazing was commenced some were resown to 'Grasslands Ariki' ryegrass and 'Grasslands Huia' white clover.

TABLE 1: STOCK NUMBERS WINTERED IN 1978 AND AVERAGE LAMBING PERCENTAGE

	Sheep				Cattle	No.
	Flock No.	Lambing %	Stud No.	Lambing %		
Ewe hoggets	—	—	92	—	18-month heifers	20
Ram hoggets	—	—	85	—	Weaner heifers	90
2T ewes	320	145-150	—	—		
Mixed-age ewes	890		160	175		
5-year ewes	210	150-160	—	—		
Rams, etc.	—	—	35	—		

Periods of rotational grazing have altered the composition, and, compared with set stocking, there is a lower content of dead material present. The increase in grazing pressure in autumn, for example, reduces flat weeds and low fertility grasses such as browntop and Yorkshire fog. The uniform and close defoliation obtained under rotational grazing, coupled with the well-distributed return of dung and urine over the paddock, leads to an acceleration of the nitrogen cycle and an increase in fertility. In addition, the close defoliation removes old, photosynthetically inactive leaves and dead material, and allows the light into the base of the sward to promote tillering and maintain clover growth.

One problem with the "all grass" system is grass grub, and following a heavy infestation 5 years ago the production of one paddock has declined to the stage where renovation by direct drilling in autumn of perennial ryegrass, and possibly Tama, will be undertaken.

During the spring of 1975, 5.5 ha of lucerne was established. The site of the stand was chosen in the floodable area by the river because of the lower fertility soil. Previously, pastures in this area "burned off" during the summer. Because of the occasional flooding of the area it was decided that, rather than disturb what valuable topsoil was there, it would be advantageous to direct drill the lucerne.

The area was sprayed in mid-October with 2 litres/ha dicamba plus 2 litres/ha 2,4-D ester to control flat weeds. Lime was applied to raise pH to the optimum of 6.5. In mid-November it received 6 litres/ha paraquat plus 700 ml Fenitrothian, for control of springtail, and 13.5 kg/ha inoculated seed was then direct drilled with 250 kg/ha of molybdenized serpentine superphosphate. The crop obtained, even under moderately dry soil conditions, was

dense and vigorous. Any future pasture renovations or renewals will be carried out by direct drilling.

During August the stand receives an annual application of paraquat plus simazine, which controls grasses and flat weeds.

For the past two seasons 2500 bales per year have been made from three cuts per season. This year it was only because of the very dry season that a total of 3000 bales was not achieved. During the April-May period, regrowth after the third cut for hay offers either excellent grazing for stud ram hoggets or a late cut of silage.

This season a small chemical preservative applicator, which can be controlled by the operator, was fitted to the hay baler. The chemical enables hay to be baled up to one day earlier, which is an important feature in Southland, for leaf loss is reduced and therefore a higher-quality hay is conserved. At a cost of under 10 cents per bale, I feel sure that this innovation definitely has a place to ensure good-quality hay.

The annual topdressing of 25% potassic serpentine superphosphate is applied to pastures during February at 375 kg/ha. All areas for hay or silage will also have had this application of fertilizer when closed.

Lucerne receives an early spring application of 33% potassic serpentine superphosphate at 625 kg/ha. If required, nitrogen fertilizer as urea is used on the beef unit, at 225 kg/ha, to promote extra growth, and, for example, was applied in early autumn this year following the dry summer.

FARMING POLICIES

All of the farming policies are aimed at correlating feed demand with supply; *i.e.*, any excess grass produced is utilized by purchasing additional dry stock (lambs and/or cattle) or is conserved as silage or hay.

During winter 1968 the somewhat traditional Southland rotation of old grass-grain-swedes-choumoellier was discontinued and the flock ewes were wintered on an all-grass system with paddocks subdivided by electric fences. I believe the biggest hurdle in changing to this type of wintering is a psychological one. It involves -accepting some muddied pasture, and this probably is the main reason why older established farmers are reluctant to adopt the practice. It is important not to break completely through the crowns of the sward. If this overtramping is avoided the pasture will recover very quickly, and this is hastened by rain. On the

other hand, if hooves break through it will take at least a season for recovery to the original thick sward, and there will be bare patches which will allow weeds to establish.

The above applied to both cattle and sheep, and the ultimate safeguard is to have a dry, free-draining area or a "sacrifice" paddock available for times when soils become too wet and the consequent pugging is likely to be detrimental to subsequent pasture recovery growth.

The sheep and cattle numbers wintered have varied only slightly over the past 5 years, while the number of dry stock introduced at other times of the year is varied to match seasonal differences in pasture production. To illustrate this point, stock numbers sold off the property for 1976-7 (a good season) and 1977-8 (a dry season) are compared in Table 2.

TABLE 2: SALES OF ANIMALS FOR TWO SEASONS

	1976-7	1977-8
18-month heifers	80	138
2-year cattle	160	35
Export lambs	1750	1900
Cull ewes	238	237
Stud 2T ewes	31	2
Suffolk rams	70	71

During the mid-1960s the property, apart from growing about 8 ha of swedes or choumoellier and a similar area of wheat, was wintering 1500 flock ewes and replacements and 200 weaner calves on a grass area of 120 to 125 ha.

We found that lambing percentage and wool weights were dropping because of too high a stocking rate. Similarly, the 200 weaner cattle, which were being wintered on a sub-maintenance diet of threshed dogstail straw, were not finishing until late the following autumn, and we were relying heavily, perhaps too heavily, on compensatory weight gain. Cattle were ready to kill when space at the freezing works was at a premium, and they were still on the property when the next year's intake of calves was arriving.

SHEEP MANAGEMENT

After shearing in early February, the Border Leicester \times Romney flock ewes are fed at maintenance. In March some 200 old ewes are culled on the basis of constitution, and the flock is further

drafted into three lines giving a main flock of 900, about 200 old ewes, and recently purchased replacement two-tooths. The reason for retaining old ewes and keeping them separate is to mate them earlier than the main mob, in order to shear them in late October-early November and send them to the freezing works as cull ewes in milk, hopefully with the majority of their lambs when they are weaned in early December. Because of problems in the freezing industry it has not yet been possible to put this into practice.

All ewes are given an anthelmintic drench with selenium 2 to 3 weeks before the rams go out, and then put on a higher plane of nutrition to increase body weight until they are generally about 65 kg. They continue on a slow flushing rotation around well-grassed paddocks. This rotation is planned to work in with the much slower wintering rotation; i.e., the flushing rotation starts where the all-grass wintering rotation is initiated-normally next to the floodable river bed.

The stud Suffolk ewes are drafted into their respective selected sire groups and the rams introduced about 25 March.

A Suffolk ram as a terminal sire is introduced to the old ewes about 7 April, and to the remainder on 16 April, at a ratio of 1: 100, with an additional 1:200 introduced after 10 days, giving a mean ram: ewe ratio of 1: 70.

Depending upon the season, but normally near the end of May, the two-tooth mob is joined with the main mob of ewes and put on to the grassed, floodable river flat, which, because it is very free-draining, will stand the concentration of stock, hopefully even during Southland's wettest times. When it becomes necessary, the ewes (main flock and two-tooth) are fed lucerne hay on this area at the rate of 1 bale/100/day for 3 to 4 weeks until about mid-June, when they begin on the grass wintering system.

Under this system, which lasts for some 75 days, ewes are mob-stocked at 1500 to 1700 ewes/ha and shifted every second day. On alternate days they are fed lucerne hay at the rate of 1 bale/100 ewes. Approximately 4 weeks before lambing, the mob goes on to a daily shift to lift their plane of nutrition.

To get a high concentration of stocking on these areas, further subdivision is required. Three triple-wire electric fences are used: one in front of the ewes, one for back fencing, and the third forming the next break ahead.

Within a fortnight before lambing, ewes are pre-lamb drenched and given a booster shot of 4-in-1 vaccine before being set-stocked around the farm;

After mating, the mob of old ewes continues on a very slow rotation around four paddocks totalling 20 ha. They are fed lucerne hay at a little over 1 bale/100/day as required. The bulk of this area is previously grazed by calves and cattle until the end of May, before they go on to their respective wintering systems.

The stud ewes, after mating, are put into one mob and slowly rotated around an 8-ha block subdivided into four paddocks before being housed in a "feeding shed-covered yard". This is usually in early June. There they are fed lucerne hay at the rate of 3 bales/100/day until mid-July, i.e., 4 weeks before lambing, when they begin break-feeding on grass.

During lambing, ewes and lambs are set-stocked at 12 to 15/ha. After tailing, yearling cattle are run with the ewes and lambs at approximately 1 /ha.

Because of the relatively intensive feeding, internal parasites are a problem. Commencing in early November before weaning, a 3- to 4-weekly drenching programme is adhered to for all lambs until slaughter during the summer-autumn period. Drenching **at this time** helps control *Ostertagia*. Lambs are weaned and drafted for slaughter during mid-December. During the past few seasons the number drafted off to kill at weaning has been controlled by the availability of space at the freezing works rather than by the number ready for slaughter.

Apart from the initial weaning draft, which is carried out by a company drafter, the monthly drafts are on a weight basis. Lambs are weighed at the rate of 400 per hour and put into three mobs according to weight: (1) ready for killing-say over 30 kg; (2) 25 to 30 kg; and (3) under 25 kg, which are grazed separately to avoid competition.

The selected weight for drafting lambs is determined by (a) seasonal changes-i.e., available feed-and (b) the meat schedule. After weaning, lambs and cattle are run together at, say, 40/ha and 3/ha, respectively, on the best quality feed available. The ewes are rotationally grazed round an area of, say, 40 ha until shearing in February. They clip about 4.5 kg wool per head. The aim here is to provide sufficient feed a little above maintenance, i.e., for wool growth only.

During **the** February-March period the Suffolk rams are sold to regular clients and a few at local ram fairs. Surplus stud two-tooth ewes which are not being retained in the flock are also in demand.

CATTLE MANAGEMENT

Lengthy, well-grown heifers are purchased at local calf sales during April. Irrespective of the breed, it is important that they will grow out and finish at good weights and all be away by the following March. As the calves arrive they are drenched and fed good quality pasture to enable maximum weight gain before winter. Hay is also fed, not only because feed tends to be soft at this time of the year but also to accustom them to a change of diet to silage during the winter.

Twenty to thirty 18-month cattle are also purchased about this time according to market conditions. These are fed as well as possible too, with the objective of having them suitable for the butchers' market during September-November when there is normally a premium paid for well-conditioned cattle. Several small paddocks are saved and provide a grass diet to carry these animals through the winter with a little supplementary hay to achieve the desired results.

At the beginning of June the weaner calves are taken off pasture, dipped, and given a second drench before being put on to either a pad or a "beef unit". The pad consists of a gravelled yard situated under a shelterbelt of macrocarpas with a corrugated iron wall to protect from the prevailing winds. Baled barley straw is used as bedding and put in as required. A pack of vacuum silage forms one side of the yard from which the calves self-feed. Their intake is controlled by an electric fence. The silage is harvested during late December by a contractor. Grass is mown, and allowed to wilt for 2 to 3 hours before being double chopped, and then vacuum packed when the 150-tonne pack is full.

The calves stay on the pad for about 100 days, during which time they each will consume $1\frac{1}{2}$ tonnes of silage or 15 kg/day. When the silage stack is nearly finished (in early September), they are rationed grass in an adjoining paddock. Set stocking, with sheep, takes places in October.

The "beef unit" consists of 8 ha strip-fenced by a permanent electric fence and by the use of temporary wires into 890-m^2 blocks. Using this system, feed budgeting is simple, and because this area divides into 90 blocks it allows 90 1-day shifts. This length of rotation is ideal in winter. During spring-summer and autumn this rotation is sped up to suit the season by adding more cattle; *i.e.*, for the 90-day wintering rotation 30 to 35 weaner calves weighing 225 kg, or 25 18-month cattle weighing approximately 360 kg, should show a minimum daily gain of 250 g. Gains to 1 kg daily are expected under normal conditions, but weight

gain is governed largely by the number of wet, cold days. The unit is grazed hard by the mob of flock ewes in late March to eliminate any clumps of grass and to ensure a good dense sward from the resulting regrowth. When the cattle start on the unit, grass is about 10 cm in height. One to 2 bales/day are fed when and if required.

A portable water supply consisting of a light trough and a long length of alkathene tubing ensures that essential water is available to each block.

As the rising 2-year-old cattle are sold (in the fat pens at the local market), store cattle are usually purchased (depending on season and markets). This practice continues through until January, with the object of buying forward 2-year-old or yearling cattle to take advantage of grass growth. One hundred to 150 cattle may be purchased during this period-keeping in mind that the majority must fatten before March.

Scales are used to determine top animals, whether it be in the selection of cattle to go into a certain mob or in the selection of cattle to be slaughtered.

When the freezing works open in late November the top yearling heifers are supplied to it at approximately 200 kg carcass weight and are subsequently drafted regularly for slaughter until March.

CONCLUSION

The main policy changes made on the property over recent years in an endeavour to increase the efficiency of grass utilization have been:

1. Relating stock feed demand to supply rather than correlating feed supply with stock demands.
2. Change of sheep breeds: The change from Romney to Romney X Border Leicester flock ewes, and also the introduction of the Suffolk as a terminal sire.
3. Changing from providing traditional winter fodder crops to an "all grass" system with the use of rotational grazing, which offers these distinct advantages.
 - (1) Improved pasture utilization control and quality.
 - (2) Early recognition of feed surpluses and deficits, enabling allocation of feed to meet present and future requirements .
 - (3) Improvements in botanical composition.