Left—Type of stock grazed. Note the abundance of danthonia in the foreground. Right—The upper reaches of the valley shown at left. The effects of burning in clearing the country preparatory to sowing can be seen in the right foreground; in the background are unburnt faces.

has given excellent results. Also, this part of the block had more dark faces and was more sheltered from drying winds than the lower part, but, when everything is considered, this block illustrates well the best method of sowing at present known to the owner and also the folly of sowing without sufficient trampling and of stocking before plants are properly established.

Stock

When the property was occupied by the present owner in 1933 the flock consisted of Merinos, and the fences were in disrepair, which allowed sheep to crowd on to the ewe country. Furthermore, the country was very dirty with tauhinu scrub and rabbits were plentiful. As a result of these conditions lambings were poor and it was considered that a change-over to half-breds would provide saleable surplus stock as improvements were effected. Lincoln-Merino first cross rams were mated to the ewes, with better results, but still lambings were not much improved. However, with good fences, clean country, and surface sowing with cocksfoot, it was possible to flush ewes for mating and lambings and wool weights improved. Today the flock may be classed as fine half-bred and a surplus of some 600 to 700 sheep is sold annually.

The following table indicates the stock improvement:—

	1944-46	1948-49
Lambing ..	44-46 per cent.	77 per cent.
Wool weight	7½lb.	8½-9lb.
Deaths ..	8-10 per cent.	3 per cent.

In blocks sown with cocksfoot lambings of 85 to 90 per cent. were obtained during the 1948-49 season (these figures are based on lambs tailed to ewes mustered).

During the period of occupation vermin have been reduced considerably, as is shown by the following table:—

	1936	1941	1945-46	1948
Goats ..	800	450*	1,500*	250
Wild sheep	600	200-300*	500*	150
Pigs ..	N.A.	N.A.	220*	50
Rabbits ..	N.A.	N.A.	7,500	N.A.

N.A. not available. *Government culled.

On the basis that 6 rabbits graze as much as 1 sheep, and that 1 goat and 1 wild sheep each graze as much as 1 sheep, the above table expressed in terms of approximate sheep equivalents is shown below:—

1936	1941	1945-46	1948
1,400	700	3,250	400

The above figures show the extent to which vermin in terms of sheep have been reduced. Before 1945 the property was carrying 3500 to 4000 sheep, together with vermin, which was equivalent to approximately 7000 sheep. Today it carries approximately 4000 sheep, and vermin are negligible. This destruction of vermin, which is equivalent to a reduction in the number of stock carried, allows spelling, which is so essential to surface sowing, and makes it possible to "do" stock better and improve the country.

Marked Improvement

The improvements which have accrued through fencing, surface sowing, and spelling, together with the control of vermin, are marked. Both the stock and grassland are being improved. With fencing and vermin control the grassland can be spelled for periods to allow cocksfoot to establish. On this ewes can be flushed for mating, lambing percentages increase, and the average wool weight increases. Furthermore, the death-rate has been reduced, which, together with improved lambings, provides a surplus of stock for sale, which augments the income. By providing an alternative source of revenue this surplus in some small measure helps to offset the vagaries of wool prices on which most high-country properties depend for their income.

To what extent stock improvements can be attributed to either surface sowing or reduced stocking by the destruction of vermin is difficult to assess. However, from the records being kept by the owner the difference between the lambings of flushed and unflushed ewes on sown and unsown blocks is 20 per cent. in favour of flushed ewes.

It is intended to sow 2 further small blocks of 500 and 200 acres, followed by others of 1500 to 3000 acres, and lastly a 10,000-acre block. A similar method of sowing to that outlined will be carried out on the small blocks, but with the big blocks, owing to the large quantities of seed required, it is intended to sow the swamps and stream beds first. It will not be necessary to spell in these circumstances and only when the first-sown areas are well established and tending to spread, will attempts be made to sow the whole block.

It is expected that aerial sowing will be of advantage in sowing the larger areas.

Conclusions

1. It is stressed that these improvements have been effected on mixed silver and fescue tussock grassland on a Hurunui soil type and on rolling to hilly country where there is little snow risk.

2. Cocksfoot has been successfully established on 5 blocks covering 1800 acres on the lower, more easily accessible parts of the run.

3. Successful establishment depends on fencing, burning, trampling, and spelling.

4. After-treatment of trampling with stock to consolidate the ground and bury the seed immediately after sowing is important for good germination.

5. Spelling for 18 months is necessary to ensure firm establishment of plants.

6. Control of vermin is essential.

7. The combined effect of surface sowing, spelling, and reduction of vermin has been improved lambings, increased wool weights, and reduced deaths.

8. There are other areas of tussock grassland with a similar type of soil and climate where cocksfoot would thrive, and this account is given for the benefit of other runholders who are contemplating surface sowing.

References

"Soil Erosion in the High Country of the South Island", Department of Scientific and Industrial Research Bulletin No. 92 (1945).