DAMAGE CAUSED TO LAMBS BY BARLEY GRASS

G. C. ATKINSON and M. J. HARTLEY
Ruakura Agricultural Research Centre, Hamilton

Summary

Pastures with a range of barley grass (*Hordeum* spp.) contents were obtained by chemical and mechanical means and stocked with lambs from mid-December to early March. Barley grass was found to have a depressing effect on lamb growth rates which was probably intensified by internal parasites and/or physical damage from the seed. The seed content of the fleece increased with increasing barley grass level as did the pelt damage. Such damage to wool and pelts was found to vary with the type and "quality number" of the fleece. The finer Down-type wools picked up more seed than coarser Border Leicester-type. Very fine wool may protect the pelt from damage.

INTRODUCTION

It is generally accepted that barley grass (*Hordeum* spp.) is an undesirable weed of high-fertility pasture throughout extensive areas of New Zealand. Surveys using data supplied by meat processing works (Loughnan, 1964; Rumball, 1970) have indicated the extent of the economic losses caused through the downgrading of wool and pelts, and carcass rejection. These surveys indicated an alarming increase in the damage caused by barley grass to wool and pelts in recent years. A survey conducted by Wasmuth (1972) showed that all but one of 166 farms surveyed on a random basis from Manawatu to Southland had barley grass present.

However, valuable as these surveys have been, there is still a need for quantitative data on the effects of barley grass in pasture and the relationships between the incidence of barley grass and the degree of seedy wool and pelt damage. This paper provides some initial data on this topic.

METHOD

An area badly infested with barley grass (*Hordeum murinum*) on the Tokanui Hospital farm in Waikato was divided into twelve 0.2 ha paddocks and different barley grass contents were induced in each paddock. The paddocks were sprayed with TCA (11 kg/ha) in 3.6 m strips, the spacing between adjusted to give from 0 to 100% spray cover, in various paddocks. Application was made on July 16.

The TCA treatment reduced the barley grass considerably but was not adequate to obtain "control" paddocks in which no barley grass was present. Therefore a forage harvester was used on January 6 to remove surviving barley grass seed-heads from these paddocks. Because of the natural variation in the initial amounts of barley grass present in each paddock, the residual barley grass population after spraying was not necessarily proportional to the area sprayed. To estimate actual barley grass populations, seed-head counts were made in 50 random quadrats of 0.145 m^2 per paddock, on January 10.

The paddocks were grazed periodically by adult sheep until the lambs were introduced on December 20. Two stocking rates, 30 and 45 lambs per hectare, were used. The lambs, which were mixed Romney and Romney cross, were weighed prior to the commencement of the trial and allocated to the paddocks on a stratified liveweight basis. They were weighed at intervals during the trial period and at the termination when carcass weights were also recorded.

The wool was classed on the skins after slaughter on March 7 when seed counts were made by detailed examination of the skin from one side of the animal. The pelts were processed and seed marks counted on the entire pelt after pickling.

RESULTS

The TCA treatment reduced the mean barley grass level from 44% to 4.5% (herbage dissection, 11/11/71). Seed-head counts on 10/1/72 ranged from nil to over one million heads per hectare.

The mean liveweight gains of the lambs, for the entire period, 10/12/71 to 6/3/72, showed an inverse relationship to the barley grass content of the pasture (Fig. 1) which was particularly marked over the first weight period (10/12/71 to 24/1/72) when at the high stocking rate the correlation was significant at the 1% level of significance (Fig. 1). This same correlation (significant at 10%) was shown in the final carcass weights at the low stocking rate (Fig. 2). The relationship was less marked at the high stocking rate at least partly because lamb deaths during the trial led to appreciable variation in initial weights of the survivors (Fig. 2). The results from the "control" paddocks have been omitted from these graphs because the forage harvester reduced the feed available and consequently lamb growth rates.

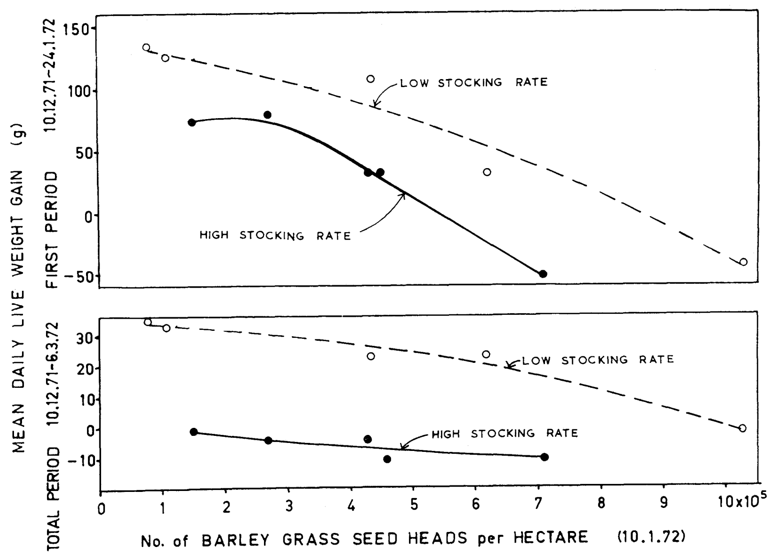

FIG. 1: *Mean daily liveweight gain of lambs against barley grass content of the pasture.*

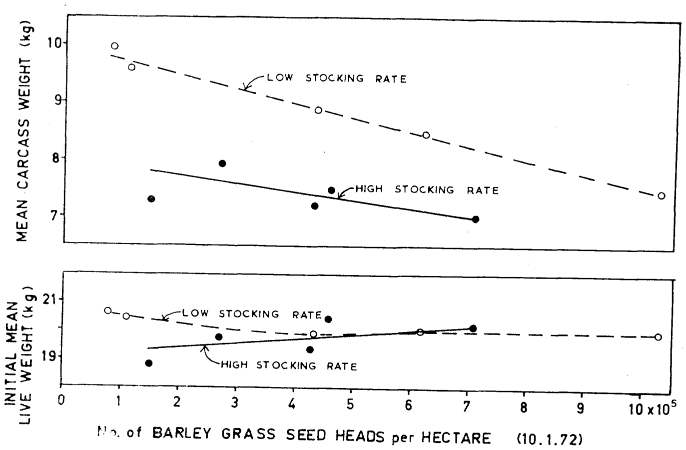

FIG. 2: *Mean carcass weight of lambs against barley grass content of the pasture and the initial liveweight.*

The numbers of seeds in the fleeces on 7/3/72 and the numbers of pelt marks are shown in Fig. 3 together with the percentages of lambs affected. For clarity the paddocks have been grouped according to barley grass level, regardless of stocking rate, to increase the number of lambs in each group, as follows:

Barley grass content:					
Range	0	0.8-2.7	4.3-4.6	6.0-10.4	× 10^5 seed-heads/ha
Mean	0	1.6	4.5	7.8	
No. of paddocks in group	2	4	3	3	
No. of lambs in group	12	28	21	16	

Analysis on a per-lamb basis showed, at low stocking rate, that pelt damage and seed content were significantly correlated to the barley grass content of the pasture (5% level of significance). At the high stocking rate, only the seed content showed a significant correlation to barley grass (1% level of significance).

Disregarding the lambs in the "control" areas, pelt damage was correlated to wool "quality number" and type at 5% level of significance (Fig. 4, Table 1). A similar trend was shown by seed content.

DISCUSSION

The relationship between weight gains (or losses) and amount of barley grass in the pasture indicates that barley grass has depressed lamb growth. Post-mortem examinations on four lambs selected at random showed high levels of internal parasitism. Thus the ill-thrift was probably aggravated by parasitic worms in spite of alternate dosing with thiabendazole and tetramisole, before the trial and at each subsequent weighing. If the effect of barley grass was expressed indirectly via worm infestation, this suggests, either that barley grass, being unpalatable and laxly grazed, allowed greater worm survival in the pasture, or that a predominantly barley grass

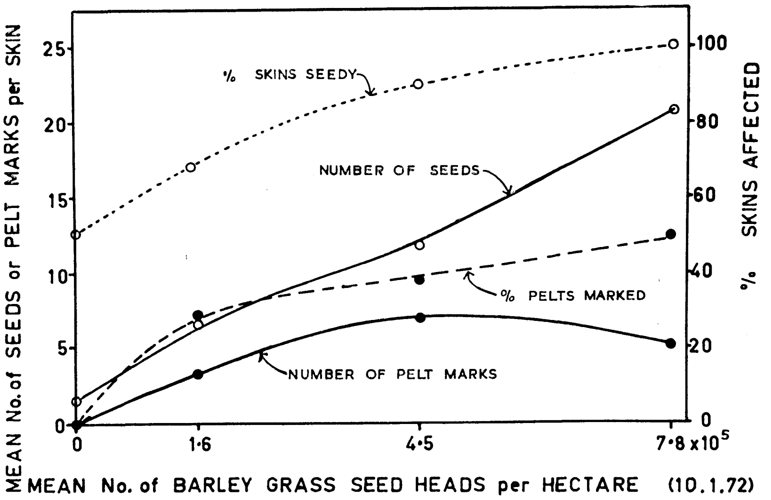

FIG. 3: *Mean number of pelt marks and seeds in the fleece against barley grass content of the pasture and percentage of the lambs affected (pooled data).*

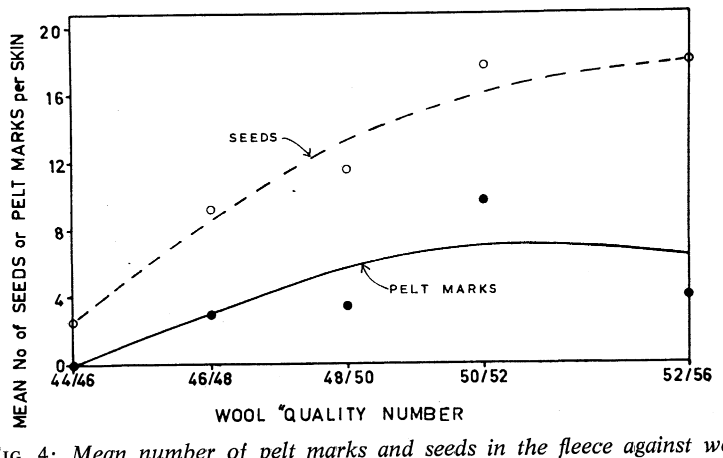

FIG. 4: *Mean number of pelt marks and seeds in the fleece against wool "quality number" (pooled data).*

TABLE 1

Wool Type	*Mean No. of Seeds per Skin*	*Mean No. of Marks per Pelt*	*No. of Lambs*
Down	22.6	11.3	13
Romney	11.3	4.4	35
Border Leicester	5.2	0.2	15

diet reduced the lamb's vigour and its resistance to the parasites. The physical damage caused by barley grass, especially to the eyes, seriously depresses lamb's growth rate (Hartley and Atkinson, 1972) and this could also have contributed to the observed effect.

The number of seeds found in the fleeces was surprisingly low considering the amount of barley grass present but in some groups there were more marks on the pelt than seed in the fleece, indicating seed must have been lost from the fleece after causing damage. This loss may have been increased by dipping which was done three weeks prior to the end of the trial. It was rather disturbing that 50% of the lambs on the "control" areas should have picked up seed and surprising, in the light of that finding, that a third of those in paddocks with 8,000 to 27,000 seed-heads/hectare did not carry seed (Fig. 3). It is possible, since there were no damaged pelts among the lambs on the control paddocks, that the small amount of seed carried by 50% of those lambs had been transferred between lambs in the truck on the way to the abattoir. However, the numbers of seed per fleece increased with increasing barley grass levels and there was no indication that the seed load had reached a maximum.

Thirty-seven percent of the lambs exposed to barley grass had marked pelts. The proportion of lambs affected rose rapidly in the presence of only moderate amounts of barley grass. Further increases in the amount of barley grass did not greatly increase the proportion of lamb pelts marked. (One single mark will result in downgrading of the pelt.)

The lambs used in this trial were a very mixed batch. This proved useful as it afforded an opportunity to examine seed content and pelt damage on the basis of wool "quality number" and type. There was an observed relationship between wool characteristics and seed content, the finer wools picking up more seed than the coarse wools, while the Down-type carried more than the Border Leicester type, Romney being intermediate. A positive correlation was shown between wool characteristics and pelt damage. However, the data indicated lessening of pelt damage with the finest wools (52-56). If this result is confirmed, it may imply that, although the fine wool will pick up more seed, these seeds do not reach the skin. This point will be investigated further in next year's trials.

ACKNOWLEDGEMENTS

We would like to thank John Dobbie, Wool Instructor, Department of Agriculture, Hamilton, for the wool classing, the management and staff of Auckland Farmers Freezing Co-operative, Horotiu, for processing the pelts, and the staff at Tokanui and Ruakura for assistance with the trial.

REFERENCES

Hartley, M. J.; Atkinson, G. C., 1972. Effect of chemical removal of barley grass on lamb growth rates. *Proc. 25th N.Z. Weed & Pest Control Conf.*: 23-8.

Loughnan, R. J. M., 1964. Economic losses from barley grass. *Proc. 17th N.Z. Weed & Pest Control Conf.*: 40-43.

Rumball, P. J., 1970. Costs of barley grass. *Proc. 23rd N.Z. Weed & Pest Control Conf.*: 77-82.

Wasmuth, A. G., 1972. The attitude of the New Zealand farmer to barley grass. Results of a farmer survey. *Proc. 25th N.Z. Weed & Pest Control Conf.*: 18-22.