EFFECT OF WOOL TYPE ON BARLEY GRASS DAMAGE TO LAMBS

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Summary

A number of lines of lambs were examined for barley grass (*Hordeum* spp.) seed damage in relation to wool characteristics. Wool type had a considerable effect on pelt damage. Down and Merino types were more severely affected than Romney while Border Leicester were least affected. Fineness of wool within a type had less effect than wool type. Shearing in December reduced damage. Early in the season storksbill (*Erodium* spp.) caused damage which healed rapidly.

INTRODUCTION

It is generally accepted that barley grass (*Hordeum* spp.) is an undesirable weed of high fertility pastures of New Zealand. The weed causes appreciable economic losses through the down grading of wool and pelts (Loughnan 1964, Rumball 1970, Shugg and Vivian 1973) and seriously impairs animal thrift (Hartley and Atkinson 1972).

A recent paper on the effects of barley grass density on the level of pelt damage (Atkinson and Hartley 1972) indicated that wool type and "quality number" had an appreciable effect on the degree of seed damage. In order to substantiate these indications a more extensive investigation was made into the relationships of wool characteristics and seed damage.

METHOD

Data were collected from a number of lambs and hoggets killed in the summer of 1973. One flock of mixed breeds was set up for the investigation and the rest were "spin offs" from other trials and a commercial flock. In all six groups were studied in three locations.

1. *Tokanui Mixed Flock*

This comprised Border Leicester x Romney, Romney and Merino x Romney lambs all shorn in December 1972 except for half the Romneys which were not shorn. They grazed as one flock on barley grass infested paddocks at Tokanui Animal Breeding Farm from December 1972 to March 1973.

2. *Tokanui Rams*

These were culled ram hoggets from a breeding trial and had grazed for two summers on the Tokanui Animal Breeding Farm. The rams, which were Border Leicester, Romney and Merino x Romney had grazed over the same paddocks but not always as one flock.

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3. SB36 Lambs

These lambs, predominantly Romney, were grazed on twelve 0.2 ha paddocks at Tokanui in which different barley grass levels had been induced in 1971 for the trial reported last year (Atkinson & Hartley 1972). They grazed, on the trial from mid-December to early March with the prime object of reconfirming the earlier results. However since the wool type distribution between the paddocks was random the pooled data have been used in the wider survey. The lambs were shorn in December.

4. Hawke's Bay (Blue)

A group of "commercial" fat lambs (unshorn) grazing the "normal" paddocks on the Lands and Survey Block, Ahuriri, Napier.

5. Hawke's Bay (Black)

Similar to above but grazing in higher barley grass infestation.

6. Templeton

Lambs from a breeding trial comprising Romney, Corriedale, Dorset and all combination inter-crosses. This flock was killed over a period from 4/11/72 to 1/3/73 and gave an opportunity to follow seasonal variations in seed damage.

Data Recorded

All wool, except Templeton, was classed for "quality number" and type either on the animals, on the skins or from mid-side samples, but the same method was used throughout any one group. All the pelts were inspected for seed damage after pickling and the number of holes recorded for the entire skin, except in Hawke's Bay where one side only was counted. The seed content of half skins was recorded for the Tokanui Mixed Flock and SB36.

Barley grass on the SB36 paddocks was assessed by seed head counts from 20 random 0.09 m² quadrats paddock in December.

RESULTS

The results are presented in Tables 1 and 2 and Fig. 1 and 2 and show wool type to have had a significant effect on the level of pelt damage and seed retention (Tables 1 and Fig 1). "Quality number", within any one wool type, had far less effect than wool type and was only significant (1%) among the SB36 Romneys where finer wool resulted in great damage.

TABLE 1: MEAN NUMBER OF SEEDS/SKIN BY WOOL TYPE

Group	Wool Type				
	Border Leicester	Romney (Shorn)	Romney (Unshorn)	Down	Merino
Tokanui Mixed Flock	3.4 dC (16)*	6.7 cC (42)	32.5 aA (29)	15.0 (2)	18.0 (29) bB
SB36 Lambs	14 (3)	16.0 (66) bB		29.2 (17) aA	

* No. of lambs in group

Fig. 1: Mean number of pelt marks by wool type for 5 groups of stock and range of wool "quality number" within type.

Shearing in December, before the barley grass season, halved the pelt damage and reduced the seed retention significantly (Table 1). There was a marked seasonal effect especially with storksbill (*Erodium* spp.) which appeared to produce a transitory damage (fig. 2).

Fig. 2: Seasonal effect of seed damage to lambs pelts caused by storksbill and barley grass. The lambs were of one flock killed on dates shown.

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There was a negative correlation between pelt damage and growth rate for the period 6/12/72 to 6/2/73 among the Hawke's Bay lambs. This only reached significance (at the 10% level) among the black group where the regression was

$$Y = (-2.3 \pm 1.3) \log_{10} (N+1) + (11.9 \pm 3.4)$$

where Y = live weight gain (kg)
N = No. pelt marks.

DISCUSSION

The amount of pelt damage among stock at Tokanui was surprisingly low considering the severe barley grass infestation on that farm. The results from the Tokanui Mixed Flock were very "disappointing" since this flock was set up to form the basis for the investigation. However, there was no shortage of damage among the Hawke's Bay lambs. Though the level of damage varied considerably between groups the trends were consistent.

Of the breeds examined the Border Leicester type suffered least damage while the finer Down and Merino types suffered most. However this did not appear to be entirely a result of fineness of wool, since, increasing fineness increased pelt damage in one group only. The high proportion of cross fiber in the Down type staple might be expected to provide increased purchase for the seed. However, the Merino staple is relatively free of cross fibres but does have a greater fibre density¹ and crimp than Romney type while Border Leicester has even less. The high lustre and loose staple of the Border Leicester appeared to give the seed little chance to grip. Shearing in December considerably reduced the pelt damage.

¹ Mean of No. of follicles/mm²

Merino	68
South Down	28
Romney	22
Border Leicester	16

A combination of these two trends would account to some extent for the high incidence of pelt damage in Hawke's Bay where unshorn Down types are frequently used for fat lamb production, and this could affect their growth rate. The same might apply to much of Canterbury.

Eye damage was also related to wool type (Table 2) but this is probably a result of the degree of face cover of the breeds. Obviously the less face wool the less chance of seed being picked up near the eyes. The unshorn Romney's were "wigged" in December therefore the effect of shearing on eye damage was not measured.

TABLE 2: PERCENTAGE EYE DAMAGE BY WOOL TYPE (BREED)

Group	Wool Type			
	Border Leicester	Romney (Shorn)	Down	Merino
Tokanui Mixed 0 (16)* bA		13 (42) aA	25 (2)	10 (29) abA
Flock				
SB36	17 (3)	32 (66) a	36 (17) a	
SB37‡	23 (31) bB	35 (149) bB	59 (17) aA	

* No. of lambs in group

‡ Data from Parawera trial (Hartley and Atkinson 1973)

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Space limitation on this paper does not permit the presentation of detailed results from the repeat SB36 trial. However, the results supported earlier findings that seed damage increased with increasing barley grass infestation while growth rate declined (Atkinson and Hartley 1972).

The data from Templeton were inadequate to determine any trends between the breeds but the pooled data gave information on the time sequence of seed damage. At Templeton storksbill proved to be a more serious weed than barley grass early in the season. Since these lambs were grazing together the rapid decline in storksbill damage after the peak in mid-November indicated a recovery from damage. Such recovery is also probable after barley grass seed damage though this seed made larger holes than storksbill. When the Tokanui ram pelts were examined for seed holes other marks were observed which could have been previous season's seed damage. These marks were not observed on lamb pelts. However, healing of seed holes in the pelt does not mean the pelt would be free of scar tissue which would spoil the tanned leather.

CONCLUSIONS

It is apparent from this work that wool type and thus breed of sheep has a bearing on the amount of damage caused by barley grass seed. Though it may not be a practicable solution, where barley grass cannot be controlled, the severity of the damage caused could be reduced by choice of breed of sheep. Selection for open faces should reduce eye damage and shearing will reduce seed pelt damage.

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