BARLEY GRASS DAMAGE TO LAMBS

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Summary

Lambs on properties in Hawkes Bay, infested with barley grass, were weighed periodically during the summer and inspected for seed damage. Seed in the eyes caused considerable weight losses but other seed irritation also affected growth. Stock losses during the barley grass season were considerable. Lambs were affected far more severely than ewes and the Southdown cross lambs were affected more than Border Leicester cross lambs.

INTRODUCTION

There is much speculation on the advantages and disadvantages of barley grass but little factual data. It is known that barley grass seeds damage lamb pelts and reduce their value and it is often assumed that such damage must cause irritation harmful to stock health. Some indication of the effects of seed damage was shown during trials to control barley grass when lambs on herbicide treated paddocks gained 8 kg per head more than those on untreated paddocks during the six weeks to mid-February (Hartley and Atkinson 1972). Weight loss was positively associated with eye damage and there has since been some evidence that skin irritation also reduces live weight gain (Hartley and Atkinson 1973).

Further data are needed on the effects of barley grass on stock performance and some work relating growth depression to various aspects of seed damage is reported here.

METHODS

Most of the data presented were obtained from one flock of lambs on a property in Hawkes Bay seriously infested with barley grass (*Hordeum murinum*) and Mediterranean barley grass (*H. hystrix**) with up to 10 million seed heads per hectare on some paddocks. The lambs were weaned in December, weighed periodically and inspected for barley grass seed damage. The lambs were drenched at weaning and grazed on several paddocks with plentiful feed. Seed in the eyes was removed at each weighing and seed numbers and damage ratings recorded. Seed was removed from the gums at the first two weighings and nostrils checked for seed in February. (Nostrils were not inspected earlier as the trouble was not noticed previously). The pelts were rated for seed damage after processing. (It was necessary to remove seed from the eyes to avoid excessive stock losses from blindness and fly strike which could arise from seed damage).

RESULTS AND DISCUSSION

The 281 lambs weighed and inspected on 18 December 1974 had a mean weight of 20.8 kg and negligible seed damage. They made normal

* *H. hystrix* is now called *H. geniculatum*.

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growth until the barley grass seed began to ripen after Christmas. By January 8 there was a mean weight loss of 1.92 kg, which increased to 2.5 kg by January 24 (after adjustment for wool weight; lambs shorn on 22.1.75). After shearing and the cessation of the main seed shed the lambs began to improve and by February 12 they had gained a mean of 0.96 kg on their December weights (adjusted for wool weight). Subsequent weights have been discounted because a severe outbreak of facial eczema mid-March indicated toxin uptake in late February.

Eye damage

Weight loss to 8 January was correlated (significant 1%) to eye damage and ranged from a mean of 1.24 kg where no eye damage was recorded to 3.83 kg where damage was severe. Each eye was rated on an 0 to 4 scale where 3 and 4 were apparently blind. The data indicated the effect of eye damage to be cumulative for the two eyes and each grade worse on total eye rating corresponded to 0.28 kg weight loss over the three week period. Weight loss was more strongly associated with damage than actual seed numbers the degree of damage being affected by the location of the seed in the eye rather than the number of seeds.

During the second period of only 8 days to 16 January weight loss was associated more with deterioration of eye condition and further seed damage than actual conditions as shown in Table 1. Subsequent weight changes were not related to eye damage possibly because the effects of such damage are most pronounced when they occur or because other irritant effects became the overriding factors. However, by 12 February the 12 lambs that had avoided seed damage to both eyes throughout had a mean gain of 2.66 kg significantly (5%) more than the 0.86 kg gain of the remainder.

TABLE 1: EFFECT OF CHANGE IN EYE CONDITION ON
LIVEWEIGHT GAIN (kg)

<i>Eye condition</i>	<i>New seed</i>	<i>No new seed</i>	<i>Mean</i>
Improved	-0.29 aA	-0.15 bA	-0.23 bB
No change	-0.38 aA	-0.11 bA	-0.26 bAB
Deteriorated	-0.73 aA	-0.53 bA	-0.68 aA
Mean	-0.475 aA	-0.21 bA	

In total 1445 seeds were removed from the lambs' eyes, mostly during January. On 8 January 863 seeds were removed from 276 lambs only 26 of which escaped with neither eye affected. Seed was present in 72% of the eyes, the worst having 12 seeds. Eight days later a further 404 seeds were removed and another 151 the following week. When the distribution of seed throughout the eyes was examined for conformity to the Poisson distribution it was found that more eyes avoided damage than expected considering the total number of seeds picked up. This occurred at each inspection and implies that all eyes are not equally vulnerable.

Eye recovery rate was high once seed was removed. Nearly 40% of the eyes were at some stage rated bad or very bad and the majority would have lost vision but by March all had recovered sight and the worst ratings were medium (Table 2). Forty-four percent of all damaged eyes apparently recovered completely including 23% of those at one time probably blind.

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TABLE 2: NUMBER OF EYES RECOVERING AS SHOWN BY DAMAGE RATING ON 6.3.75 VERSUS WORST PREVIOUS RATINGS

Damage rating (6.3.75)	None	Worst damage rating during period				Total
None	86	Slight 68	Medium 57	Bad 39	Very Bad 2	252
Slight		13	55	81	16	165
Medium			9	27	11	47
Total	86	81	121	147	29	464

Mouth damage

The lambs were assessed for the amount of barley grass seed stuck in the gums on 8 January. There was a slight but non-significant negative correlation between seed in the gums and weight loss. However, severe seed abrasion to the lips appeared to reduce final weight gain. The 10 lambs worst affected and still scarred on 12 February had gained 0.66 kg less than the rest by that date. The real effect of such damage would be greater since nearly all lambs had seedy cheeks and this comparison was between bad and very bad rather than between good and bad.

Nose damage

The penetration of seed up the nostrils was not recorded at the earlier examinations as the problem was not noticed though it had probably occurred. On 12 February the seven lambs that were recorded as having seed in the nostrils had gained 0.82 kg less than their contemporaries.

Pelt damage

By the time the first draft of lambs had gained sufficient condition for killing most seed damage to the skins had healed and scar tissue covered the holes. Actual counts of seed damage could not, therefore, be made and pelt damage was assessed on a visual rating (four assessments). There was no measurable relationship between degree of pelt damage and live weight gain to 12 February.

Breed and age effects

The main flock of lambs were Romney-Southdown crosses with 10 Romney-Border Leicester crosses. Breed differences were quite marked. To 8 January the 10 Border Leicester cross lambs lost 0.6 kg per head while the Southdown cross lambs lost 1.99 kg each. By 12 February the Border Leicesters (now eight) had gained 2.88 kg each while the Southdowns had gained 0.93 kg. Both differences were significant at 5% level of significance. Initially the Border Leicester cross lambs were about 1 kg/head lighter than the Southdown crosses.

TABLE 3: INCIDENCE OF EYE DAMAGE AS AFFECTED BY BREED

Breed of lamb	Number Animals	Number and % eyes affected	Total number seeds	Mean No. seeds/eye
Main flock*				
Border Leicester cross	8	5 31%	16	1.0
Southdown cross	224	373 83%	1429	3.2
Second flock†				
Border Leicester cross	56	23 21%	14	0.13
Southdown cross	54	65 60%	103	0.95

* affected at some stage 18.12.74 to 24.1.75.

† one inspection only 16.1.75 — "deseeded" two weeks before.

Of the 12 lambs that avoided seed in the eyes four were among the eight Border Leicester crosses (50% clear) while only 3% of the Southdown crosses avoided damage. The trend was confirmed by examination of a further 110 crossbred lambs from another flock (Table 3). The Southdown cross lambs picked up significantly (1%) more seed and suffered more damage but the Border Leicester crosses suffered relatively more damage without seed being present. Either these animals, with their more protruding eyes, were damaged by other means or they were more able to eject seed from the eyes.

Comparative data for vulnerability of stock of different ages were difficult to obtain as the majority of lambs in the district were crossbred and thus differed from their dams. However examination of one flock where a number of ewes and lambs were of similar type and running together showed lambs to be significantly (1%) more vulnerable than ewes (Table 4).

TABLE 4: INCIDENCE OF EYE DAMAGE AS AFFECTED BY AGE

<i>Breed</i>	<i>Number Animals</i>	<i>Number and % eyes affected</i>		<i>Total number seeds</i>	<i>Mean No. seeds/eye</i>
Border Leicester type					
Lambs	24	13	27%	12	0.25
Ewes	72	6	4%	5	0.03
Romney type					
Lambs	11	10	45%	13	0.59
Ewes	32	3	5%	2	0.03

NOTE: stock "deseeded" ten days earlier therefore some eye damage could have been retained from seed previously extracted.

Stock losses

Stock losses were considerable. Of the original 281, only 130 (46%) reached saleable fat condition. Thirty-nine (14%) were "lost" during the barley grass season, most died or were assumed to have died, but a few may have escaped or lost their tags. About 90 (30+%) had to be killed because of facial eczema and 20 were still too small to sell in June. Though the major loss was due to facial eczema this loss could, indirectly, be attributable to barley grass because had the lambs' growth not been checked by barley grass damage in January they would have reached slaughter condition by mid February before they developed facial eczema symptoms. The lambs that had to be killed in April because of facial eczema had a lower live weight gain to 12 February than those ultimately sold, 0.66 kg versus 1.12 kg per head.

Barley grass species

The pasture on which the main "observation flock" was grazing had the two barley grass species *H. murinum* and *H. hystrix* in an approximately 1:3 ratio on seed head numbers. Seeds collected from the eyes of a random portion of the flock on 16 January were identified as 28 *H. murinum* and 69 *H. hystrix*. This did not differ significantly from the estimated ratio of seed in the paddock and confirms a previous observation that both species are equally dangerous to eyes (Hartley *et al.* 1974).

Seed collected from the lambs' nostrils (usually 10 to 20 seeds/nostril) however, were exclusively *H. hystrix*.

Previously it had been found that seed stuck in the gums was heavily dominated by *H. hystrix*, even when the species was in the minority in the pasture but that seed in the skin was proportional to that in the pasture (Hartley *et al.* 1974).

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DISCUSSION

The data recorded here show the severity of damage that can be sustained by sheep from barley grass seed. Eye damage is the most serious single aspect but not the only growth reducing factor. Because of the severity of damage and absence of an undamaged control flock on similar pasture the real depression could not be measured. There were a few animals free from eye damage but none without some seed irritation to face and body, therefore there was no comparison possible between damage and no damage, only between degrees of damage, mostly at the severe end of the scale.

The slight negative relationship between seed in the gums and weight loss may be an indirect effect of other factors affecting feeding whereby those lambs that were eating less picked up less seed.

The considerable difference in vulnerability shown between the two breeds examined and the ages of sheep indicate that breeding and grazing management may reduce damage from seed and should be exploited where barley grass cannot be controlled economically.

The very high stock losses sustained by this flock show the potential dangers of barley grass when infestation becomes severe. The lower weight gain to February of those which subsequently succumbed to clinical symptoms of facial eczema may mean that earlier stress reduced their tolerance to toxin or that these animals were less tolerant to any stress.

The equal or greater damage caused by *H. hystrix* means that this small, less obvious species cannot be ignored.

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