

## ECONOMIC LOSSES FROM BARLEY GRASS

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### *Summary*

Though barley grass (*Hordeum murinum*) has been evident for many years, it recently has brought about serious losses. These have shown up particularly within the meat industry. The weed competes vigorously where pastures open up during summer. Being unpalatable, it represents complete loss of grazing area and the irritation of the seed to sheep undoubtedly attains cruel proportions. Penetration of it into the flesh has caused the rejection of over a quarter of the carcasses in some lines of lambs and lamb pelts damaged by seed have amounted to over a fifth of the whole season's output by some fellmongeries.

We have learnt to change the natures of our soil and of its covering herbage to suit our requirements, and to do this accurately. But so long as we make such changes, we must accept and be prepared to cope with various complications which accompany them. The appearance of barley grass (*Hordeum murinum*) within the pastures and its accelerating rate of increase over the last few years has reached frightening proportions.

Barley grass, a native of Mediterranean countries, has been present for many years, but it is only just recently that it has become a problem. Previously it belonged where it caused little worry, in places of such high fertility that other grasses refused to grow — in the rich soil of sheepyards, sheep camps, along fence-lines, close to gateways, along the edges of pastures where the grass gives way to bare soil beside shelterbelts. Though it prefers highly fertile conditions, it will grow on poorer soils. It is, however, a poor competitor in the seedling stage and, being an annual, has fought a losing battle in the permanent pastures.

In the past decade or so, farming systems have improved in such a way as to bring a double advantage. Good pasture grasses have been evolved which, together with improved field husbandry, have enabled heavier stocking. This, in its turn, has raised soil fertility by the greater return of dung and urine. Pastures, however, especially on the lighter lands, still open up in the summer. Hay or seed crop aftermaths, ground worn bare by heavy treading or eaten bare by grass grub; these have opened up to allow ingress to barley grass. With the higher fertility, it has managed to get past its vulnerable stage before the normal grasses have tillered out in competition. Now it may be found anywhere out in the paddocks.

It occurs anywhere in New Zealand except in areas of constant summer growth in the pastures such as in North Auckland and Southland and in the higher rainfall areas against the Tasman coast, Taranaki, Westland, and the western half of Nelson province. Some occurs in Waikato, and areas becoming badly infested are Hawke's Bay, Manawatu, Marlborough, Canterbury and Otago — central and northern Otago being the worst. (Here, incidentally, another species, *Hordeum hirtum*, also occurs.) Nor is it creeping only in amongst the exotic grasses, but being responsive to nitrates and phosphates,

it is appearing amongst the native grasses of hill country that have been topdressed.

There is an elementary principle of nature that anything protects its own: fish, fowl, animal or plant. Once a stand of barley grass is firmly established, it steadily re-seeds at its verges and spreads outwards each summer.

It is not possible without intensive research to measure the area of good grazing pasture being lost, but a good indication can be obtained by studying the frightening increase of damaged sheep pelts. Even in the seedling stage, or as young and apparently succulent leaf, the plant is unpalatable to stock though sheep can be forced to eat it when it is very short. Close observation while stock are grazing will disclose that they recognize it by its feel. It is rather rough and hairy and an animal's lips can be seen to recoil spontaneously away from a tuft. Sufficient to say, then, that wherever this grass does occur in the pasture the area may be considered a dead loss as concerns any grazing value.

We turn then from one factor almost impossible to calculate to another just as difficult, namely that of physical discomfort — suffering, indeed. And this is a very important factor. Apart from its humanitarian angle, there will be a definite economic loss if any animal is uncomfortable and restless.

In the animal world, it is the human being which accepts the least physical discomfort without complaint. Many animals will indicate irritation with a swish of the tail or a reflex twitch of the skin and even the sheep itself will nibble away at its own wool upon the irritation of parasites. But, at the same time, it will accept quite stoically the interminable nagging, excruciating pain of footrot and, until this impairs its locomotion, will maintain its condition, bear and rear a healthy lamb. In other words, a sheep can withstand great pain.

It is easy, therefore, to realize that what can be to us a decided upset — a single seed penetrating shirt and singlet — is to a sheep merely a petty annoyance. But multiply this many thousands of times and it attains cruel proportions. Not only that, but the seeds will steadily work through the skin and deep into the flesh. In these instances though we see many an example of a rejected carcass which, but for the seed, would obviously have been Prime Quality, there are sometimes isolated instances of individual animals that have wasted away to an emaciated condition. No tangible example of this has become available in the immediate past season, but there was at least one during 1961–62 in a line which, unfortunately, the writer is now unable to trace exactly. Sufficient to say that it was of mainly Prime Quality with a number of carcasses rejected seedy; and it included one emaciated lamb.

This unfortunate beast had, it can now only be assumed, suffered from seed which had penetrated right into the abdominal cavity for, apart from being emaciated, it was also suffering from peritonitis.

A carcass rejected as seedy usually has the seeds lodged under the fell. Every case induces a bruise; some bring about suppuration. The animal can accept this agony and still thrive, but should the odd seeds pass deeper, they will eventually cause similar conditions within the abdomen or thorax. As far as the meat inspectors are concerned, they are rejected as cases of peritonitis or pleurisy and that is that. But it can well be reasoned that cases do occur in which these two diseases do not always come about through abdominal rupturing or respiratory causes, but occasionally have been the result of slow, ruthless penetration of seeds from outside.

During January, 1964, a line of 176 lambs from North Canterbury passed over the chain at the Canterbury Frozen Meat Company's Belfast works. They included 48 lambs (average weight 30.6 lb) rejected as seedy. Of eight (of about the same weight) graded FAQ, five had been slightly damaged by seeds. The remaining 120 of Prime Quality also averaged about 31.5 lb. Parts of the rejected carcasses could be salvaged and were sold for local consumption, but even so their value fell from 49s. 10d. per head to 29s. 4d.

These lambs had been grazed on a paddock of excellent rape. In one little corner which the plough could not reach, was a patch of barley grass. It must have been much favoured as a camping place, since every fleece, every pelt and a third of the carcasses had been damaged by the seed. Though this was one of the worst instances of the season, it was anything but an isolated case.

The pelts themselves render the most startling and depressing facts of all.

In 1953, 0.08% of all skins passing through the three Canterbury Frozen Meat Co. works was graded as seed-damaged. In 1958 this return rose to 0.12%. In the 1961-62 season, the figure was alarming enough — 8.7% — and in the following year it rocketed to 21.9%. This past season's returns were not available at the time of publication, but it can safely be assumed that they are not less.

These figures represent damage appreciable to expert visual examination, but they are not all. In working through the skins, the seed does mechanical damage to the fibre. Natural bodily processes appear to repair this, but the mark of the weld is there for good as an outwardly invisible cicatrice which none of the pre-tanning or tanning processes reveal.

Nine-tenths of New Zealand's lamb pelts go to the United States for the manufacture of high-grade clothing leathers — suedes. It is not until the final buffing to raise the suede nap that every single cicatrice shows up. It appears as a pale, almost white spot where the surface fibre obstinately refuses to stand up because it has enlarged into little nodules. No brushing or dyeing will disguise the marks. This leather can only be used for Second Quality or lining leather and must immediately be discounted by the fellmongers who sold it.

Losses sustained by the Canterbury Frozen Meat Company from the downgrading of pelts over the 1962-3 season, calculated at the rate of 20s. per dozen on 370,730 skins, amounted to £30,895 and this may be considered as a reduction of dollar earnings by \$86,000. It also represents the loss from only 3 out of some 35 fellmongeries in the country. Admittedly, some of the stock came from amongst the worst infested areas.

Though this paper confines itself to the economic significance of barley grass, a proportion of the pelt damage has been done by the seeds of storksbill (*Erodium* spp.). This makes its appearance from October until the turn of the year and it is about then that barley grass takes over the role of Nature's scourge. In the past season, perhaps because of the damp conditions of early summer in Canterbury, the storksbill problem was not as great as in the two previous summers. Lying in the damp ground, the seed would have been softer and less liable to be picked up by fleeces. Nevertheless, it was still much in evidence.

The losses do not take into account the wasted effort of many skilled hands: from the fellmongery puller at one side of the world to the suede buffer at the other: labour, freight, insurance, the lot. And the pelts have long since lost their identity before much of the damage is manifest.

Until now the cure has lain in selective weedkillers and it will be so for a year or two yet. But selective weedkillers, however effective, are merely a palliative and furthermore, in this instance, are a recurring annual cost. To gain the greatest long-term benefit, chemical means must be allied with effective habitat control—a densely tillering grass even in pasture subject to summer drought.

The Grasslands Division, Department of Scientific and Industrial Research, appears to have developed such an ally and, it is hoped, a permanent one.

"Ariki" (*Lolium hybridum*) is a new hybrid ryegrass derived from short-rotation (*L. multiflorum* × *L. perenne*) and New Zealand perennial ryegrass (*L. perenne*). It is aggressive the way it responds to even the smallest amounts of water during summer and, though, it is not as highly productive during winter as short-rotation ryegrass, it maintains a dense tiller population during all seasons and apparently resists the invasion of annual grasses so prevalent in Canterbury. Trial plots at Lincoln (K. F. O'Connor, pers. comm.) under heavy and lax grazing, with or without artificially supplied nitrogen, side by side with similar plots of other pasture grasses have borne this out dramatically. It is a grass greedy for nitrogen and appears to demand more than the usual clovers can fix. But there are strong hopes that new strains of clover will soon follow it into the pastures to overcome this problem. The first stocks of nucleus seed are to be released in the coming season, so it is reasonable to suppose that Ariki will be commercially available by 1967.