Blowfly strike in sheep: a review of some recent research in Western Australia

N Monzu

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A review of some recent research in Western Australia

Over the last six years Departmental workers have made important discoveries which could help farmers minimise the effects of blowfly strike. The findings are helpful also to the researchers, who must decide what direction future investigations should take.

This series of studies started with a survey of blowfly strike in sheep, the control measures flock owners adopt, and the success of these measures. As expected the survey indicated some possible problem areas. Since then Department of Agriculture Entomologist N. Monzu, Sheep and Wool Research Officer S. G. Gherardi, and Microbiologist S. S. Sutherland have undertaken projects to define these problems and seek ways of overcoming them.

The Western Australian survey 1975-77

Summary of findings

The most important primary blowfly species is still Lucilia cuprina (the Australian sheep blowfly). The native West Australian brown blowfly Calliphora albifrontalis also is involved significantly as a primary species on a localised basis.

Breech strike is still the major blowfly problem on farms surveyed despite the wide adoption of mulesing. Body strike is more important in the higher rainfall areas. There are indications that scouring, the type of mules operation and tail length can influence breech strike while mycotic dermatitis probably is predisposing to body strike.

The main strike problem occurs in spring. Breech strike is at its worst in September and body strike in October.

Background

The survey was undertaken during 1975-77 by Animal Health Division Veterinary Officers in conjunction with CSIRO scientist, M. D. Murray. Mr Murray had coordinated similar surveys in New South Wales, South Australia and Victoria.

One hundred and seventeen farmers participated. Their properties are shown in Fig. 1. Unfortunately, the 1977 drought in the northern and eastern areas severely reduced the information collected from that area.

Each farmer was asked to fill in management sheets, to record strikes in booklets and to collect maggots for identification of the blowfly species, over a two year period. The information was recorded and analysed by CSIRO officers under Mr Murray.

Results

The monthly incidence of all fly strikes is shown in Fig. 2. The total of sheep reported struck for 1975-76 was 3.5 per cent, and for 1976-77, 1.9 per cent.

Primary flies around a strike area.
Breecch strike was involved in 70 per cent and 80 per cent of cases respectively. This was surprising, as 9 out of 10 of the sheep under study had been mulesed. The breech strike data collected over the two years revealed that 2.3 per cent of strikes were recorded in mulesed sheep compared with 6.7 per cent in unmulesed sheep.

The strikes in mulesed sheep varied with the type of mules operation:

- Radically mulesed 1.8%
- Mulesed and tail stripped 1.6%
- Mulesed, but no tail strip 7.0%

The indications are that under the management systems employed, mulesing without tail stripping probably had little advantage, but radical mulesing was no better than the ordinary mules-and-tail strip.

The breech strikes were recorded as: crutch (below the anus), tail (above the anus), or mixed if both areas were struck. There were more strikes involving the tail than the crutch.

Dags predisposed the animals to tail strike. Worm parasites, scouring and short tails predisposed sheep to dag formation.

The overall findings indicate that, although most sheep are mulesed, the operations are not giving the best protection under the pasture and parasite management practiced in many cases.

On all but 13 farms, lambs were mulesed at marking and thus protected before the peak flystrike period in September.

Body strike tended to occur later than breech strike as the weather warmed. The overall incidence was only about one sheep in each 100. Major problem flocks were mainly in areas receiving more than 500 mm rainfall per year. (Areas VII, IX and X in Fig. 1.) The farmers recording body strike often noted mycotic dermatitis or fleece rot preceding or associated with the strike. For example, a property in area X noted mycotic dermatitis in a flock in September. During October, 87 body strikes occurred on the shoulder and loin. Many of these appeared to be in the areas affected by dermatitis.

Other strikes: Often more than 10 per cent of a ram flock suffered poll strike. In two cases 30 per cent of a farmer’s ram flock had poll strike.

Pizzle strike was seen very rarely. Wound strike occasionally occurred following mulesing and marking when conditions favoured blowfly strike.

Jetting and crutching

The practice of mulesing decreased the need for jetting. Six out of 10 mulesed flocks were jetted compared with all unmulesed flocks. The average unmulesed flock was jetted twice a year. Jetting of mulesed and unmulesed flocks to control body strike was more common in the southern and central areas, where one in four strikes were on the body.

However, most flocks were still crutched at least once a year whether they were mulesed or not. Only two out of 10 mulesed flocks were not crutched.

Value of results

The relationship between tail strike and the type of mules operation and scouring is a possible problem area. The results of work undertaken already are reported in this article.

The body strike problem in high rainfall areas appears to be predisposed by mycotic dermatitis or fleece rot. This has been documented further, and reported in this article. Work on dermatitis and strike is in progress. There are early indications that eggs laid near a dermatitis lesion are more likely to lead to a strike than if they are laid elsewhere.

The overall survey results confirm other findings that September and October are the months when most...
strike occurs, and that the green blowfly *L. cuprina* is still the main blowfly species involved in strikes.

**Blowfly species involved in sheep strike in Western Australia—N. Monzu**

The results of two recent studies revealed that there are three primary species of blowflies striking sheep in Western Australia. The Australian sheep blowfly (*L. cuprina*) has proved to be the species responsible for the highest incidence of single-species strike. However, the studies differed in their findings as to the importance of two native blowfly species—the Western Australian brown blowfly (*C. albifrontalis*) and the lesser brown blowfly (*C. nociva*)—as important primary strikers on sheep.

The blowfly survey results indicated that while *C. albifrontalis* was responsible for 17 per cent of the combined strikes, it caused only two per cent of the single-species strikes. In contrast, 1978-79 studies implicated *C. albifrontalis* in 10 per cent of single-species strikes.

*C. albifrontalis* is a cool temperate south western species which only appears in the hotter and drier central and northern agricultural areas of Western Australia for a brief period during late winter and spring. Because *C. albifrontalis* is not equally abundant or seasonally active simultaneously throughout its range, it may be reasoned that to validly determine the strike incidence of this species, researchers must apply equal effort both in favourable and unfavourable areas. The distribution of the sampling stations in the Murray survey revealed that there were twice as many sampling sites in areas unfavourable to *C. albifrontalis*, therefore its significance as a primary species in Western Australia was underestimated.

Both studies confirmed that the lesser brown blowfly (*C. nociva*) is not likely to be involved.

*A group of fly-struck sheep.*

*Maggots developing in a struck area.*

<table>
<thead>
<tr>
<th>Type of mules</th>
<th>Tail length</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Short</td>
<td>Uncruched</td>
<td>Cruched</td>
</tr>
<tr>
<td>Unmulsed</td>
<td>21</td>
<td>63</td>
<td>13</td>
</tr>
<tr>
<td>Modified mules</td>
<td>11</td>
<td>31</td>
<td>2</td>
</tr>
<tr>
<td>Radical mules</td>
<td>0</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 1. Average incidence of breech strike from crutching to shearing in 1978 and 1979 (Percentage)
Table 2. Body strike data and associated causes collected from Mt. Barker Research Station (1979)

<table>
<thead>
<tr>
<th></th>
<th>Myotic Dermatitis</th>
<th>Fleece rot</th>
<th>Myotic Dermatitis + fleece rot</th>
<th>Clean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number affected</td>
<td>113</td>
<td>30</td>
<td>41</td>
<td>53</td>
</tr>
<tr>
<td>Number struck</td>
<td>45</td>
<td>3</td>
<td>11</td>
<td>1*</td>
</tr>
<tr>
<td>Percent of affected</td>
<td>40</td>
<td>10</td>
<td>27</td>
<td>2</td>
</tr>
<tr>
<td>animals struck</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per cent total number</td>
<td>57</td>
<td>3</td>
<td>17</td>
<td>0</td>
</tr>
</tbody>
</table>

*Mycotic dermatitis—affected area

significantly as a single-species striker. However, this species was involved in the highest incidence of mixed strikes, especially with *L. cuprina*. In fact, of the 30 per cent mixed strikes reported in the 1978-79 studies, 75 per cent associated *L. cuprina* with either *C. nociva* or *C. albifrontalis*.

In these primary species associations, it appears almost as if the two species are striking side-by-side, making it difficult to determine which of the two was responsible for the initiation of the strike. In some of those mixed strikes, the native Calliphorid species could be responsible for initiation with *L. cuprina* subsequently taking advantage of the strike.

In view of this possibility, perhaps both *C. albifrontalis* and *C. nociva* could be even more significantly involved as single species strikers than is indicated by the surveys. Much more research is needed to clarify the roles of primary species striking in combination.

There is support for the contention that the native Calliphorid blowfly species in Western Australia. However, there are two native Calliphorid species, particularly *C. albifrontalis* and *C. nociva* which can be important on a more localised basis as primary strike species.

**Types of mules operation and tail length—S.G. Gherardi**

An experiment was designed to determine the relationship between the incidence of breech blowfly strike and:
- Type of mules: nil v modified (ordinary) v radical
- Length of tail: first apparent joint (short) v tip of vulva (long)
- Mid-season crutching.

Merino ewes were used in the trial.

The results proved the overall effectiveness of the mules operation in reducing the problem of breech strike. They showed also that:
- Mid-season crutching decreased the level of breech strike markedly on both unmulesed and modified mulesed sheep;
- Mid-season crutching is not required to prevent strike on radically mulesed groups with long tails, but may be required if tails are short;
- there are more strikes on sheep with short tails.

Thus, if the mules operation is to be effective to prevent blowfly strike:
- the tail should be left long (to the tip of the vulva)
- if the ewes are not to be crutched a radical mules operation is necessary
- if they are to be crutched, ordinary mules and tail strip is enough.

**Mycotic Dermatitis and blowfly strike—S. G. Gherardi, S. S. Sutherland and N. Monzu**

Local information collected from a high rainfall area Research Station at Mt. Barker between 1977 and 1978 demonstrated that mycotic dermatitis lesions predispose sheep to body strike.

In a group of approximately 300 weaners, 33 of the 46 (72 per cent) body strikes recorded were associated with visible dermatitis lesions. Only 12 (26 per cent) were associated with fleece rot.

The results of a field trial conducted at Mt. Barker Research Station in spring 1979, confirmed the association between mycotic dermatitis and body strike on sheep. Strike data collected from 237 lambs that had been examined at the start of the trial for fleece rot and/or mycotic dermatitis is shown in the table.

The trial confirmed that:
- Body strike occurs in predisposed areas;
- Dermatitis affected areas are more likely to be struck than fleece rot affected areas.

**Acknowledgement**

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