Doublegee control in pasture: what is it worth

D J. Gilbey
R. J. Lightfoot

Follow this and additional works at: https://researchlibrary.agric.wa.gov.au/journal_agriculture4

Part of the Agricultural Economics Commons, Sheep and Goat Science Commons, and the Weed Science Commons

Recommended Citation
Available at: https://researchlibrary.agric.wa.gov.au/journal_agriculture4/vol20/iss1/8

This article is brought to you for free and open access by Research Library. It has been accepted for inclusion in Journal of the Department of Agriculture, Western Australia, Series 4 by an authorized administrator of Research Library. For more information, please contact jennifer.heathcote@agric.wa.gov.au, sandra.papenfus@agric.wa.gov.au, paul.orange@dpird.wa.gov.au.
Doublegee control in pasture — what is it worth?

By D. J. Gilbey, Weed Agronomy Branch and R. J. Lightfoot, Sheep and Wool Branch

A recent study showed that the cost of spraying to control a heavy doublegee infestation can be recovered in the year of the spraying.

Farmers are often concerned by young sheep becoming crippled and growing poorly on paddocks badly infested with doublegee. Doublegees are a particular problem in the year following a crop unless pastures are sprayed for control.

Cropping reduces the number of dormant doublegees in the soil, but a few surviving seeds can always germinate in regenerating pastures, the first year after cropping. These plants can produce a large quantity of new seed if not controlled. For example pastures at Wongan Hills have produced 5 500 viable doublegee seeds per square metre during the year following a crop. Previous research has shown that selective spraying can stop this seed build up, but can sheep grazing on sprayed pasture respond profitably to such treatment?

This article gives results of a study at the Department of Agriculture’s Chapman Research Station in 1977, which was designed to help answer this question.

The trial

The paddock used for the trial, like many in the northern wheatbelt in the first year after a crop, was heavily infested with doublegee. It was subdivided and fenced into six plots each of about 2 ha.

Two of the plots received no treatment, two were sprayed with 500 grams of Tribunil* per ha and two with 1 000 grams of Tribunil per ha. Spraying was done on June 17, 1977.

Six weeks after spraying, the doublegee seedlings on each plot were counted. On September 14 the area covered by doublegee plants was measured and finally on November 7 samples of pasture and doublegee burrs from the soil surface were collected from each plot.

* Registered trade name of Bayer Aust. Ltd.

Inspecting sheep’s feet for doublegee

Sheep management

Ten merino ewes each with a single two to four week old lamb at foot, were introduced on to each of the doublegee infested plots in mid July. The stocking rate of 4-5 ewes per hectare was chosen as representative of the district. Each month all ewes and lambs were weighed, and their feet inspected for damage and presence of doublegee burrs. Early in November the lambs were taken from the plots and consigned to the W.A. Lamb Marketing Board for slaughter and grading.

Table 1. Effect of spraying on the pasture

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Doublegee seedlings per m²</th>
<th>Doublegee in pasture 14/9/77 %</th>
<th>Burrs per m² 7/11/77</th>
<th>Total ** pasture 7/11/77 tonne/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil spray</td>
<td>154</td>
<td>35</td>
<td>2.774</td>
<td>1.7</td>
</tr>
<tr>
<td>500 g/ha</td>
<td>32</td>
<td>8</td>
<td>1.554</td>
<td>1.4</td>
</tr>
<tr>
<td>1 000 g/ha</td>
<td>8</td>
<td>2</td>
<td>0.373</td>
<td>1.5</td>
</tr>
</tbody>
</table>

** Total pasture excluding doublegee foliage.
Growth rate of lambs
Lamb growth was measured from the time of their initial placement on the plots until they were removed for slaughter 15 weeks later. There was no difference in rate of lamb growth between plots sprayed with either 500 or 1 000 grams of Tribunil per ha, but overall, lambs grazed on the treated plots grew faster than those on unsprayed pasture (22-3 kg liveweight vs 18-6 kg on the unsprayed plot at 15 weeks (Table 2).

Value of the lambs
Lamb carcases from the sprayed plots graded better than those from unsprayed plots (59 per cent red and 41 per cent white compared to 30 per cent red and 70 per cent white) and therefore returned a higher price per kilogram. As a result, lambs from the sprayed paddocks yielded $6.80 per ha more than those on the unsprayed paddocks (Table 3).

In this experiment the growth advantage of merino lambs run on sprayed paddocks was realised in extra returns from higher carcase weights at slaughter. Even where lambs are not sold for slaughter, results indicate that weaners reared on doublegee infested paddocks will enter the summer at a reduced liveweight. This is supported by the common observation that a bigger "tail" occurs in weaner flocks reared on doublegee infested paddocks.

Wool production
The experimental ewes were carrying almost 11 months growth of wool when shorn in mid May. However, as all groups ran as one flock during the 4½ months immediately before shearing, only the first six months growth actually reflects differences between treatments. Visual assessment of fleeces indicated no differences in style or yield between treatments so all fleeces were bulked into one bale and consigned to the Australian Wool Testing Authority for evaluation. The average fleece returns calculated according to fleece type and based on AWC reserve values at that time are shown in Table 3. Estimated in this way, wool from ewes grazed on the sprayed plots yielded $2.20/ha more than that from the unsprayed controls.

Body weight of ewes
Ewes were weighed monthly throughout the growing season. In general, the average gain in weight by late November reflected the success of doublegee control in each of the sprayed plots. By late November ewes run on the lightly infested sprayed paddocks were 5 kg heavier than ewes run on the heavily doublegee infested, unsprayed paddocks (11-9 kg liveweight gain vs 6-9 kg).

Ewes on the sprayed paddocks not only gained 5 kg more in body weight than those on unsprayed paddocks, but also cut more wool and their lambs gained more weight. The economic value of ewe live weight gains is probably more easily assessed in terms of the meat value as cast-for-age ewes. If they were sold in November 1977 at 40c a kg carcase weight (average market value at the time) the heavier carcase weight would have yielded about $1 a ewe, or $4.50 per ha, extra in favour of spraying for doublegees. Alternatively, if the ewes had not been sold, but kept for breeding, those on the sprayed paddocks should have produced about 10 per cent more lambs because they were in better condition at mating. At $11 per lamb, this would yield an extra $5.00 per ha.

Table 2. Effect of doublegee control on carcase value

<table>
<thead>
<tr>
<th></th>
<th>Unsprayed plots</th>
<th>Sprayed plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average lamb carcase weight</td>
<td>12.10 kg</td>
<td>13.63 kg</td>
</tr>
<tr>
<td>Average carcase price per kilogram</td>
<td>60.50 cents</td>
<td>64.80 cents</td>
</tr>
<tr>
<td>Average value per lamb (carcase only)</td>
<td>$7.32</td>
<td>$8.83</td>
</tr>
<tr>
<td>Difference in value per ha</td>
<td>$6.80 more</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Effect of doublegee control on fleece weight and value

<table>
<thead>
<tr>
<th></th>
<th>Average greasy wool weight kg/head</th>
<th>Average value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsprayed plot</td>
<td>4.84</td>
<td>$6.39</td>
</tr>
<tr>
<td>Sprayed plots</td>
<td>5.21</td>
<td>$6.88</td>
</tr>
<tr>
<td>Difference in value per head</td>
<td>+0.49</td>
<td>-2.20</td>
</tr>
<tr>
<td>Difference in value of wool produced per ha</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4. Effect of spraying doublegee on the feet of ewes and lambs

<table>
<thead>
<tr>
<th></th>
<th>Ewes</th>
<th>Lambs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fore</td>
<td>Hind</td>
</tr>
<tr>
<td>Unsprayed plot</td>
<td>5.5</td>
<td>1.3</td>
</tr>
<tr>
<td>Sprayed plots</td>
<td>2.7</td>
<td>0.5</td>
</tr>
</tbody>
</table>
Foot injuries
The feet of all ewes and lambs were inspected monthly during the trial. The number of burrs found in each hoof was counted and the degree of foot injury caused by doublegee was assessed.

More than twice as many burrs were found in the hooves of both ewes and lambs grazed on the heavily infested doublegee paddocks (Table 4), and the incidence of foot injury was correspondingly higher. The front feet were more severely affected by the burrs than hind feet.

In this trial, effects of reduced foot injury were not separated from those due to improved pasture production. However reports indicate that sheep can become lame to such a degree that their grazing is affected, resulting in considerable liveweight loss. This varies but in severe cases can result in the death of affected animals.

More generally, problems over summer are heightened, and sheep require more careful management and extra handling.

Conclusions
These results show that ewe and lamb production can be increased if pastures with heavy doublegee infestations are sprayed with Tribunil. In most years "spray graze", 2, 4-DB or Tribunil would give similar control to that obtained in this trial.

"Spray graze" using 2, 4-D amine which costs about $4.70 per ha is the most economical form of doublegee control in pasture, although it has limited application because its success depends on high stocking rates and it cannot be used on medic pasture.

Recommended rates of 1.5 litres of 2, 4-DB per ha costs about $7.60 per ha and 850 grams of Tribunil per ha about $11.50 per ha. All costs include application.

The immediate profitability of doublegee control depends on how much production is increased compared to spraying costs.

A number of benefits to livestock are possible following spraying for doublegee control. First, spraying can increase both the quantity and quality of available pasture. In many situations the nutritive intake of sheep grazing such pastures would be increased.

Consequently, in the case of ewes, the greater feed intake should increase body weight, conception rate, foetal growth, milk supply and wool production. Deaths of ewes should be reduced with the availability of more feed, and lamb deaths could also be reduced because of improved vigour and growth.

Control of doublegees should produce more marketable lambs of higher average grading in a shorter time. Furthermore doublegee control could benefit livestock production through reducing foot injuries in ewes and lambs. However, this study measured only those benefits that could be expressed in economic terms. It showed that spraying for doublegee control yielded an extra $6.80 per ha in lamb values, $2.20 per ha in wool value, and an estimated $4.50 per ha in the value of the ewes—a total of $13.50 per ha. This was $8.80 per ha more than the cheapest method of doublegee control and $2.00 per ha more than the most expensive method.

Whether or not it will always pay to spray a particular paddock cannot be generalised. Obviously the decision will vary between farms, paddocks and years. It will be affected by the type of stock being run, the stocking rate or level of feed availability, and access to alternative "safe" grazing for highly susceptible stock such as ewes with lambs.

In general spraying is least likely to be profitable when running dry stock at low stocking rates in a good pasture year. However if lambing ewes are being grazed at moderate to high stocking rates in doublegee affected paddocks, losses in production are likely to be substantial.

Thus spraying stops the massive build up of doublegee seed which lasts for several years, and can increase sheep production profitably.

Acknowledgments
This trial has been a co-operative venture involving staff from five divisions of the Department of Agriculture. To all who assisted their contribution is gratefully acknowledged. In particular specific mention should be made of Messrs R. Nicols, Geraldton District Office and J. Ferguson, Manager Chapman Research Station for their sustained efforts to ensure that the trial ran successfully.