Fungal diseases on annual medics stimulate production of phyto-oestrogenic compounds such as the coumestan, coumestrol. Barbetti and Fang (1991) reported that ungrazed medic-pastures infected with high levels of *Phoma* black stem disease can contain more than 100 ppm of coumestrol. Smith *et al.* (1979) found that the reproductive performance, especially ovulation rate, can be depressed in ewes which eat large amounts of *lucerne* containing 100 ppm of coumestans resulting from fungal infection.

This paper reports a survey done over 4 years where data were collected from a range of environments in Western Australia (WA) to give an indication of the incidence and concentrations of coumestrol in medic pastures and whether infection by *Phoma* disease was always associated with high concentrations of coumestrol. Green plants were collected from paddocks in late spring in 4 districts in the drier parts of the agricultural area. These samples were examined for insect damage and incidence of fungal diseases before being dried and then assayed for coumestrol. Handfuls of dry material were collected from the same locations after senescence and then assayed. Samples of burrs were also assayed.

Overall, the mean levels of coumestrol and the incidence/severity of *Phoma* infection were low. However, there were a few samples in 1989 with concentrations of coumestrol up to 800 ppm. In 1989 and 1991 there were significant positive correlations (P < 0.001, r = 0.68 and 0.96, respectively) between the incidence/severity of *Phoma* disease and the coumestrol content for both green and dry samples of medic. There was no relationship between these parameters in 1992.

The results suggest that high concentrations (> 100 ppm) of coumestrol in green and recently senesced medic pastures do not usually occur in most areas in WA. Therefore, it appears from these limited results that the reproductive performances of ewes joined on these pastures are unlikely to be affected, especially when ewes grazing these pastures would also have a mixture of plants available to them.

### Table 1. The concentrations of coumestrol and the incidence/severity of *Phoma* in medic samples from the agricultural areas of Western Australia

<table>
<thead>
<tr>
<th>Year</th>
<th>Species</th>
<th>Coumestrol</th>
<th>Phoma incidence/severity (0-10 scale)*&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No.</td>
<td>ppm</td>
</tr>
<tr>
<td>1989</td>
<td>Spinless burr</td>
<td>green</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dry</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>burr</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Barrel</td>
<td>green</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dry</td>
<td>1</td>
</tr>
<tr>
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<td>Spinless burr</td>
<td>burr</td>
<td>14</td>
</tr>
<tr>
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<td>Spinless burr</td>
<td>green</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Barrel</td>
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<tr>
<td></td>
<td></td>
<td>dry</td>
<td>5</td>
</tr>
<tr>
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<td>Spinless burr</td>
<td>green</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Barrel</td>
<td>green</td>
<td>2</td>
</tr>
</tbody>
</table>

*<sup>a</sup>*0-10 scale where 0 = healthy plants, 10 = severely diseased plants. Values in parentheses are ± s.e.

The officers of the Department of Agriculture who provided the samples from Geraldton, Merredin, Lake Grace and Katanning Districts are thanked. The coumestrol assays were done in The Isoflavone Laboratory, The University of Western Australia.