A successful campaign against the euro

E H M Ealey

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RESULTS from a five-year research programme carried out by the C.S.I.R.O. on the Abydos-Woodstock Pastoral Research Station indicated that euros could be controlled in a practical and economic way by the traditional method of water poisoning, if it was continued for an extended period and carried out over a large area. Small-scale trials supported this claim, but no opportunity had occurred to assess the practicability of a large-scale poisoning operation.

One of the authors (Richardson) recently bought Eginbah Station and later acquired the adjoining property, Talga Talga, near Marble Bar. As he intended managing Talga Talga while residing at Eginbah, he moved the Talga Talga stock to the paddocks near Eginbah for convenience. On hearing of these arrangements, Ealey wrote suggesting that he did not cut off the water in the destocked paddocks but should use them for a poisoning campaign along the lines recommended by the C.S.I.R.O. Richardson agreed to do this; and in fact he had already started poisoning at six waters on September 20, 1959. Poisoning at the remaining seven water points was started at different times during November. The area was carefully surveyed by Ealey on November 26, 1959, when the greater part of the euro kill had taken place, and the results compared with the previous survey carried out in November 1956.

A high euro density prevailed on Talga Talga despite 15 years of consistent poisoning for six-day periods during November and December. It is the prevailing local opinion that once poisoning is commenced it should be continued for six days regardless of whether hot dry days occur or not. One of the most important results of the C.S.I.R.O. investigation was the discovery that the euro population included both frequent and habitually infrequent
Shows distribution of sheep immediately after shearing which was done in May

Legend: Each dot represents 10 sheep

Stock were moved to these paddocks in September and half the station was poisoned

Legend: Each dot represents 10 sheep. The area poisoned is outlined with the thicker black line. Numbers represent waters mentioned in Table 2. W indicates the position of natural waters available to euros during poisoning.
drinkers, the latter being individuals that harboured in places where they could avoid the daytime heat, such as caves in granite outcrops. The bulk of the euros coming to drink in cool weather would be the frequent drinkers, which would be poisoned in hot dry weather anyway; so it is virtually a waste of time to poison for short periods in a spell of cool weather.

The previous owner of Taiga Talga had observed that, in the past, large numbers of euros could be poisoned in a six-day operation, but this was not the case in recent years, although similar poison strengths were used under similar conditions. It is possible that years of six-day poisoning may have culled out most of the frequently drinking euros, so that the bulk of the population in recent years consisted of hardier types of animals, such as are found in drier localities.

It had been pointed out to pastoralists that six days of water poisoning would make an impression on euro numbers only if carried out under ideally hot dry conditions, and if care was taken not to interfere with the animals' normal drinking habits. As this would involve an extremely tedious procedure in stocked paddocks, and weather conditions are so variable, it was recommended that poisoning be carried out over an extended period in paddocks that could be destocked as part of a deferred grazing programme. The local pastoralists expressed doubt as to the practicability of this recommendation for the following reasons:

(1) On a run-down station, the sheep have to be spread over all the paddocks to survive a dry summer, and so paddocks cannot be destocked until after the first rain, when of course water poisoning would be useless. It was claimed that on some stations even two-thirds of the total area could not support the flock for the period between shearing and the summer rains.
(2) Even in early summer, sheep cannot be moved without fear of a loss of condition that would endanger their survival through the hot season.

(3) If the paddocks to be poisoned were left empty after shearing, or mustered in early summer, a considerable number of stragglers would inevitably remain and would be poisoned.

(4) Shorn sheep can easily get through fences; and they would make their way back to their old paddocks, break through the strand-wire fences around poisoned troughs, and drink the poisoned water.

The experience gained during the Talga Taiga campaign, described below, showed that none of these objections need be accepted as valid.

Stocking Arrangements.—Talga Taiga (211,000 acres, 2,300 sheep) had been run in the traditional manner with a few stock in every paddock. Soon after it was acquired by Richardson, in August 1959, all the sheep were concentrated into four paddocks (see Map), so that instead of a stocking rate of one sheep to 100 acres there was a rate of one sheep to 20 acres, despite the fact that the summer was beginning and it was a drought year (see Table 1).

It should be noted that the paddocks used during the summer (except the ewe paddock) were almost entirely spinifex paddocks. Analyses carried out by the C.S.I.R.O. have indicated that young spinifex plants may still have a high protein content in summer, when other grasses have become dry and very low in nutritive value. This may explain why the sheep were still in excellent order when examined in late November. Both authors

Table 1

<table>
<thead>
<tr>
<th>Points</th>
<th>Number of Days</th>
<th>1958</th>
<th>1959</th>
</tr>
</thead>
<tbody>
<tr>
<td>335</td>
<td>4</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Points</th>
<th>Number of Days</th>
<th>1959</th>
<th>1959</th>
</tr>
</thead>
<tbody>
<tr>
<td>140</td>
<td>2</td>
<td>0</td>
<td>64</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>31</td>
<td>313</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>37</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>13</td>
</tr>
</tbody>
</table>

Fig. 3—Weighing and measuring euros to obtain data on breeding, growth and nutrition.
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are convinced that when there is nothing but spinifex for the sheep to eat, there is no advantage in the practice of spreading stock over the entire station. This view is also held by H. Suijdendorp (personal communication), and is confirmed by the observations on Talga Talga.

Some of the waters to be poisoned were cut off in September; and for three weeks stragglers were caught waiting at empty troughs and transported by truck to the stocked paddocks. C.S.I.R.O. observations had indicated that it was preferable not to cut off waters before poisoning, because
of the inevitable disturbance in the euros' drinking habits. Subsequent experience supported this contention, and showed that it was quite safe to poison the water and erect tight stranded-wire fences to keep stragglers out. These were collected when the mills were visited twice a week. Seventy stragglers were collected during the campaign: only four forced their way through the strand-wire fences and were poisoned.

Poisoning Arrangements.—The poisons used were arsenic pentoxide and sodium arsenite. The latter was prepared from arsenic trioxide (white arsenic) and soda, or purchased under the name of "Liquid Arzeen" or "Cooper's Weedicide." Cooper's Weedicide was being tested for the first time, and the dose of 6 fluid oz./40 galls., calculated by C.S.I.R.O., proved to be adequate. The other poisons were used at the strengths recommended in the Agricultural Journal of W.A. (May-June 1959, issue.)

A very important innovation suggested by the previous owner was the provision at the water points of 200-gallon tanks, fitted with ball cocks. These were filled with poisoned water, and installed at the ends of the sheep troughs. The provision of these storage tanks made it unnecessary to visit the troughs every day, which would have been impracticable anyway.

Six water points were poisoned for 68 days before the C.S.I.R.O. check-survey, six for periods of from 10-21 days, and one for seven days (see Table 2). Where warranted, poisoning was continued after the survey until it rained.

Results.—The amounts of poisoned water consumed were measured and, after allowing for evaporation, the kill was estimated on a basis of two euros per gallon. This figure is based on C.S.I.R.O. experiments, and is known to be conservative. The amounts of poisoned water used at the different water points, and the calculated number of euros killed, are given in Table 2.

Even where water had been poisoned for 68 days, occasional fresh tracks were

---

Table 2

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of Mill</th>
<th>Date Poisoning Commenced</th>
<th>Number of Days</th>
<th>Gallons Used</th>
<th>Evaporation*</th>
<th>Gallons Drunk</th>
<th>Euros Killed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No. 3</td>
<td>Sept. 20</td>
<td>68</td>
<td>420</td>
<td>180</td>
<td>240</td>
<td>480</td>
</tr>
<tr>
<td>2</td>
<td>Townsend</td>
<td>do.</td>
<td>68</td>
<td>2,000</td>
<td>60</td>
<td>1,940</td>
<td>3,880</td>
</tr>
<tr>
<td>3</td>
<td>Eastward</td>
<td>do.</td>
<td>68</td>
<td>150</td>
<td>60</td>
<td>90</td>
<td>180</td>
</tr>
<tr>
<td>4</td>
<td>Shallow Well</td>
<td>do.</td>
<td>68</td>
<td>1,350</td>
<td>180</td>
<td>1,170</td>
<td>2,340</td>
</tr>
<tr>
<td>5</td>
<td>Knob's Well</td>
<td>do.</td>
<td>68</td>
<td>500</td>
<td>60</td>
<td>440</td>
<td>880</td>
</tr>
<tr>
<td>6</td>
<td>13 Mile</td>
<td>do.</td>
<td>68</td>
<td>300</td>
<td>120</td>
<td>180</td>
<td>360</td>
</tr>
</tbody>
</table>

(Total Euros Poisoned in Two Months) 8,120

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of Mill</th>
<th>Date Poisoning Commenced</th>
<th>Number of Days</th>
<th>Gallons Used</th>
<th>Evaporation*</th>
<th>Gallons Drunk</th>
<th>Euros Killed</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Dam</td>
<td>Nov. 6</td>
<td>21</td>
<td>1,800</td>
<td>1,000</td>
<td>800</td>
<td>1,600†</td>
</tr>
<tr>
<td>8</td>
<td>Little De Grey</td>
<td>do.</td>
<td>21</td>
<td>660</td>
<td>35</td>
<td>625</td>
<td>1,250</td>
</tr>
<tr>
<td>9</td>
<td>Armstrong's</td>
<td>Nov. 13</td>
<td>14</td>
<td>500</td>
<td>15</td>
<td>485</td>
<td>970</td>
</tr>
<tr>
<td>10</td>
<td>Andy's</td>
<td>do.</td>
<td>14</td>
<td>150</td>
<td>15</td>
<td>135</td>
<td>270</td>
</tr>
<tr>
<td>11</td>
<td>Gap</td>
<td>Nov. 17</td>
<td>10</td>
<td>200</td>
<td>10</td>
<td>190</td>
<td>380</td>
</tr>
<tr>
<td>12</td>
<td>No. 1</td>
<td>do.</td>
<td>10</td>
<td>120</td>
<td>10</td>
<td>110</td>
<td>220</td>
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<tr>
<td>13</td>
<td>Dyke</td>
<td>Nov. 20</td>
<td>7</td>
<td>200</td>
<td>13</td>
<td>187</td>
<td>374</td>
</tr>
</tbody>
</table>

Total Euros Poisoned to November 27 11,584
Euros Poisoned since November 27 1,250
Euros Poisoned during whole campaign At least 12,834

* Calculated from mean monthly evaporation figures for the Marble Bar District obtained from Meteorological Bureau.
† Poison used here was accidentally made double strength and evaporation from dam surface was high so calculated kill is very conservative.
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noted which indicated that there were still some animals in the area which were drinking for the first time that summer or were moving in from outside country. Poisoning was therefore continued; but the amount of poisoned water drunk was too small to measure.

It was most fortunate that a trace of rain had fallen three days before the C.S.I.R.O. survey, enabling fresh tracks on the roads and euro pads to be noted. Stony roads had to be ignored in this assessment of residual euro activity, but on 13.8 miles of sandy road a total of only eight fresh tracks was noted in the areas that had been poisoned for 68 days. Granite outcrops were searched in these areas, and only nine live euros were seen. There was also little evidence of live euros near mills that had been poisoned for 14-21 days.

During the previous survey, in November, 1956, particular attention had been paid to the Shallow Well area (4 on map) because it carried a dense euro population and near-by soaks prevented useful results being achieved by poisoning for the customary six days. At the time of this campaign, some of the soaks had dried out, but within one mile of Shallow Well soaks containing up to two inches of free water were being used by euros. Nevertheless there were dead euros all around the soak area, and these animals had presumably used the mills at some time or other during the protracted period of poisoning. C.S.I.R.O. observations have indicated that animals chased from soaks by fighting could be expected to drink at the nearest artificial water.

Of the nine live euros seen in the Shallow Well area, seven were at these soaks. The surrounding rocky country was traversed, and of the 29 pads examined only two showed fresh euro tracks. The survey had been timed so that a standard transect (ie. 20 minutes before sunset at 15 m.p.h.) could be made between Shallow Well and Knobs Well—this being the area containing the soaks. Standard transects during

![Fig. 6—A euro drinking. For efficient poisoning it is important not to interfere with their drinking habits](image)

![Fig. 7—Weeping Grass (Chrysopogon) which has been heavily grazed by euros. Nevertheless much of the seed has been allowed to form](image)
the 1956 survey gave counts of 33 and 40 euros in 2.2 miles. On this survey no euros were seen—except many dead ones under trees.

It will be seen from Table 2 that at the time of the check-survey at least 11,500 euros had been killed on the area served by the poisoned water points, which was

approximately 120,000 acres. An additional 1,250 euros were poisoned before heavy rain fell; and the treated area is now almost completely cleared of euros. It should be emphasised that the campaign that gave this very satisfactory result did not involve as much time, manpower or money as had been required to poison 15,000 euros over the entire 15-year period during which the traditional six-day poisoning operations were employed.

C.S.I.R.O. studies on euro reproduction indicate that no significant increase due to breeding will occur while poor seasons persist. Even in a run of good seasons a local euro population that had been dealt with effectively by a well-planned poisoning operation should not build up to pest proportions for at least ten years.

The following points in the Taiga Taiga campaign are worth emphasising:—

(1) All stock remained on the station during the whole period of the operations.

(2) Although the stocking rate was greatly increased in a few paddocks, stock remained in good order for the months they were concentrated.

(3) Through careful handling it was possible to move stock in September without harming them.

(4) The losses among stragglers were negligible.

(5) Stock withstood the above treatment despite drought conditions and losses due to drought were no worse than on adjoining stations.

(6) Excellent results were obtained despite nearby natural water.

(7) Although the main kill occurred during the early part of the campaign, occasional euros were still being poisoned after 68 days. This emphasises the desirability of an extended poisoning period.

ACKNOWLEDGMENTS

The authors are grateful to Mr. J. Greene, the former owner of Taiga Taiga, for much practical information on water poisoning techniques. Some of the equipment used had been designed and tested by him during previous euro poisoning campaigns. His friendly co-operation and assistance with poison trials he allowed to be carried
out on Talga Talga were much appreciated by C.S.I.R.O. officers while they were working in the district.

LATER OBSERVATIONS
Since this article was written, the poisoned area was visited by H. Suijendon-dorp, the Department of Agriculture’s Regional Adviser, Carnarvon. In a letter to E. H. M. Ealey, dated August 1, he wrote:

Euros on the 100,000 acres poisoned by Richardson were conspicuous by their absence. There were no tracks over wheel-tracks made a week prior to our visit. The vegetation in the poisoned area showed definite improvement when compared with the euro-infested region. A good stand of annuals was present among the spinifex tussocks, and a light scattering of Kapok bush seedlings was noticed all over the stony hills.

Considering this is the first wet season after the removal of the euros, this response should be considered well worthwhile.

Many of the local pastoralists have visited the region and for this coming summer a big poisoning campaign is planned to cover a region of well over half a million acres.

TAPEWORMS IN DOGS
Nearly all farm dogs are infested with tapeworms to a greater or lesser degree. Where heavy infestations occur, the dog’s health may suffer unless the animals are specifically treated for the removal of the parasites.

There are many species of tapeworms and infestation commences with small heads which attach themselves to the bowel wall and grow by adding segments until, in some species, the adult tapeworm may be composed of a head and hundreds of segments with a total length of up to 6 ft.

Segments from the tail end of the worm, fall off at intervals and are passed in the droppings. They commonly cause irritation and when a dog is seen dragging itself along the ground in a sitting position it is usually a sign of tapeworm infestation.

While tapeworms rarely cause death, heavy tapeworm infestation can lead to digestive upsets, paralysis of the hindquarters and can be a contributing cause of skin diseases.

Arecoline hydrobromide is the best drug available for expelling tapeworms. It is sold in tablet form and an easy method of administration is to crush a tablet and dissolve in a small quantity of water in a small medicine bottle. Slip a finger inside the dog’s cheek to form a pouch, pour in the drench and hold the mouth shut until the liquid is swallowed. Doses, according to dog size, are:

<table>
<thead>
<tr>
<th>Grain</th>
<th>Terrier</th>
<th>Sheep Dog</th>
<th>Kangaroo Dog</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1/2</td>
<td>1</td>
</tr>
</tbody>
</table>

As the drug sometimes causes vomiting, walk the dog for a few minutes after dosing, then put it on the chain and observe for half an hour. The drug should produce violent purging, but if this does not occur, give a second dose using half the quantity of arecoline hydrobromide given in the initial dose.

All droppings should be removed and burnt when the purging ceases. Repeat the dose as a routine practice every six months.

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