Aerial baiting against wild dogs in Western Australia

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Department of Agriculture

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AERIAL BAITING - Flight Routes
AERIAL BAITING AGAINST WILD DOGS AND FOXES IN WESTERN AUSTRALIA

By A. R. TOMLINSON, Chief Vermin Control Officer

The history of aerial baiting against wild dogs in this State dates back to July, 1946 when an experimental aerial baiting scheme was conducted by the Meekatharra Vermin Board in conjunction with the Department of Agriculture using an aeroplane supplied by Airlines (W.A.) Ltd. The operations lasted for three days and covered portions of the Meekatharra Vermin District in the inland of the North-West of Western Australia. A Department of Agriculture dogger travelled on the aeroplane to direct and assist. He had visited the areas on which baits were dropped before the baiting flight and travelled through them again after the baiting. He found only one carcass, but reported the tracks of dogs were much fewer than before the baiting.

It was considered that the results obtained justified further trials, but some difficulty was experienced in obtaining supplies of suitable baits. These were required in large numbers and had to be suitable for storing for long periods.

By mutual agreement, the Queensland, Commonwealth (for the Northern Territory), and Western Australian Governments decided in 1947 to make available the sum of £5,000 each for the carrying out of aerial baiting, primarily as an experiment to ascertain the value of this work.

In Western Australia it was decided that the £5,000 should be spent over a four-year period and that the experimental work would be carried out over the North-West and inland areas. Later it was decided to reduce the period to three years and to increase the sum advanced to over £8,000.

Preparations were commenced immediately for a small flight to be carried out in the Wiluna area in January, 1948, in which a distance of about 900 miles was to be flown and 35,000 baits to be dropped. Unfortunately, heavy rains fell throughout the areas and the flights were abandoned.

It was then decided that a campaign should be arranged for October, 1948. The results obtained on these flights were considered satisfactory and it was decided to continue the campaign in 1949 and 1950. In the 1949 flights, Vermin Boards were allowed to make use of the aeroplane while it was in their vicinity, and the Roebourne-tableland and Ashburton Vermin Boards availed themselves of this opportunity of experimentally dropping baits against dingoes and foxes.

In 1950 the baiting flights were extended to cover the country to the north-east, east and south-east of Laverton, and also to the south of Sandstone. The local Vermin Boards contributed to the cost of some of these flights.

In 1951 a further extension was made to include a flight over the country south of Southern Cross. In this year also, a project
was conducted in the Kimberleys in conjunction with the West Kimberley Vermin Board which carried out a similar project in 1952.

In 1953 an experimental campaign was conducted in the North-West and Eastern Goldfields during May and June. This was timed to coincide with the mating season when dogs are considered to be particularly vulnerable to poison baiting.

**BAITS**

Experiments carried out early in the aerial baiting campaigns established the fact that fatty substances—particularly if preserved by cooking—made the most suitable baits. Brisket fat was found to be excellent and met all of our requirements such as resistance to heat, keeping qualities and attractiveness to dogs. This information was confirmed by details received from Queensland, where a trial had been conducted soon after the Meekatharra flights. In Queensland, brisket fat baits were dropped in a continuous stream at regularly-spaced intervals, firstly by hand, and later by an automatic device controlled by the pilot.

Following upon the initial flight, arrangements were made for a local firm, David Gray and Company, to manufacture some trial baits from fats, cows' udders and strychnine supplied by the Department of Agriculture. The strychnine used was in half-grain alkaloid tablets, which not only dispensed with the necessity for measuring the lethal dosages (one-third of a grain is sufficient to destroy a dog), but greatly facilitated the large-scale manufacture of baits.

In the earlier campaigns, baits were prepared by processing the meat or fat in boiling brine after which the material was cut into approximately one-inch cubes. Half-grain strychnine tablets were inserted into the centre of each cube which was then wrapped in paper. The cutting, inserting of tablets and wrapping were all done manually. The use of paper wrappings for baits is the procedure followed by many of the Department's most experienced doggers and possesses the following advantages:

1. Improved handling and keeping qualities as the wrapped baits do not adhere to one another and the air circulates freely between them.
2. The baits are protected against ants and against the elements.
3. Where green paper is used for wrapping, the baits are less likely to attract the attention of birds.

As previously mentioned, brisket fat was found to be the most effective material, but shortages of this substance necessitated the use of udder tissue from cows and sheep. Although many known kills were obtained.
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with these meats, they did not compare with brisket fat in keeping qualities and general attractiveness.

The brisket fat baits remained soft and undamaged even after being exposed to the sun or held in sealed drums. The paper wrappings became greasy and made the baits attractive to dogs. The other materials were apt to become dry and hard in the sun—although they would often soften after rain. Baits must be placed in sealed containers for coastal shipping and baits other than those made from brisket fat deteriorated very rapidly under such conditions due to the “sweating” which took place in the containers.

In 1951 baits were obtained from the Tropical Dip and Chemical Company, Sydney, which manufacturers them in Queensland. This firm also supplies the Queensland and South Australian Governments. These baits were made of brisket fat and the method of preparation was similar to that of the local process except that the fat was “dry-salted” for three weeks and then boiled for three-quarters of an hour. These baits proved most effective and were used in all subsequent campaigns.

DROPPING OF BAITS

Baits were dropped in batches of from 20 to 80 in number on carefully selected targets. The aeroplane flew at a low level and an observer (the Department's highly experienced Officer-in-Charge of Doggers in the Pastoral Areas) seated in the front, signalled to the operator the number of baits that were required and when they were to be dropped through a chute. Experiments showed that the baits fell almost straight down from the releasing point. There was very little forward movement, and side winds had no appreciable effect. It should be noted, however, that no really strong winds were encountered.

Some Vermin Boards, when using the aircraft, carried out baiting for foxes along rivers, coastal sandhills and around coastal mangrove swamps. Such baits were dropped at regular intervals as there were no specific targets and a maximum coverage was the aim. This method is ideal for foxes harbouring in the North-West coastal sandhills. A stream of baits is dropped on one side of the hills on the outward flight and on the other side when returning. Three baits were dropped each second at 120 m.p.h.; this meant that the baits landed 20 yards apart or about 90 to a mile. This method could be used for wild dogs when water is not scarce; for example, if rain fell earlier than usual or during the mating season.

AIRCRAFT

Avro-Anson seven-seater aircraft were used in all the campaigns. Tenders were called and Airlines (W.A.) Ltd. have carried out all the flying except in the Kimberleys where the MacRobertson

Fig. 2.—Sacks of prepared baits ready to be loaded on the aircraft at Balfour Downs Station
Miller Aviation Company Pty. Ltd., operated. It has been most fortunate that the aviation companies and the pilots have displayed keen interest in the work. This enthusiasm has materially assisted in the success obtained.

BAITING PERIODS
For the main campaigns conducted in the North-West and inland areas, October is considered the most favourable month for two reasons:

(a) Pups are old enough to move round hunting for food, but are not sufficiently experienced to avoid baits.
(b) This is the driest time of the year in these areas (particularly the North-West) and dogs must concentrate on waters which in most cases are few and far between. To experienced bushmen these waters are readily discernible from the air.

In the Kimberleys, September was selected for the same reasons, although the pups would be younger. However the possibility of earlier rains makes October baiting too risky in these areas.

In the mating times, the targets are similar in dry conditions but, if surface water is present, baits are dropped along the banks of watercourses or lakes. Targets away from the hills and hideouts are concentrated on during this period as the dogs are moving over the foothills and on the plains.

CENTRES AND FLIGHTS
Bases which are most convenient and most centrally situated in the areas to be baited have been selected. In many cases these have been sheep and cattle stations. The ready assistance and co-operation of the owners and managers of these stations has been a great contribution to the success of the campaigns. In other places, town aerodromes were used and the assistance of local Vermin Boards and others has been given with equal readiness.

Flights have varied in length, ranging up to about 520 miles.

PLANNING AND PREPARATION
With the aid of information obtained from Government doggers, all the flights are carefully planned and plotted on maps, using readily identifiable landmarks, such as high peaks or ranges, watercourses, lakes, homesteads, etc. Mileages are calculated and allowances made for deviations along watercourses, etc. Numbers of baits are estimated. All this information is then
converted to quantities of baits required at centres and distances to be flown for fuel requirements. An exact timetable of arrivals and departures must be worked out, taking into consideration the direction of flights in relation to the sun (eastward flights in the early morning or westward flights in the late afternoon must be avoided if possible). Allowances are made for plane servicing and for resting the crew as the work is extremely hot and strenuous.

Unfortunately, circumstances and conditions have proved quite unfavourable for complete reliance to be placed on any of these methods for the following reasons:—

(a) The baits were dropped, as far as possible, in areas too inaccessible or too remote for our ground men to operate over and therefore our main means of observation was limited. Endeavours were made to send our men in to baited localities wherever possible, but even this was curtailed by shortages of men.

(b) Seasonal conditions resulted in unusual movements of game and dogs. For instance, in 1949 early rains fell in the Ashburton while adjoining localities were dry. The subsequent influx of wild dogs was very heavy. Furthermore, over the years during which flights have been conducted, extremely dry and harsh conditions have prevailed in the north and inland of Australia, resulting in dogs being forced in from the inland desert and other regions. The 1952-53 “wet” has resulted in strips of heavy rain with other areas very dry.

(c) High prices for wool have made sheep losses more noticeable on all stations. Where formerly a few dead sheep were a matter of shillings, their loss is now measured in pounds. Even where dogs are known to be less in numbers and losses fewer, complaints have increased.

Fig. 4.—Rugged country near Mt. King in the Hamersley Ranges

This planning is followed by preparation involving chartering the aeroplane and conferences on the flights. Baits are ordered and arrangements made for deliveries. Owners of stations where bases are planned, and others, are contacted and informed of the part they are to play. Vermin Boards are requested to co-operate in organising all stations into district-wide poisoning drives to coincide with the aerial baiting.

The planning and preparations require months of detailed and careful work, but they are considered very necessary parts of the campaigns. The smoothness with which the operations have been conducted is the direct result of the preliminary work.

RESULTS OBTAINED

The three obvious methods of observing results are:—

(1) the number of carcasses seen;
(2) a decrease in the number of scalps handed in at local Vermin Boards;
(3) reports of decreases in sheep losses or in wild dog numbers.

Fig. 5.—The shadow of the aircraft on the ground framed by the bait-dropping chute

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However, the results obtained under these headings were:

<table>
<thead>
<tr>
<th>Campaign</th>
<th>Live Dogs Seen From Planes</th>
<th>Carcasses Found After Campaign</th>
</tr>
</thead>
<tbody>
<tr>
<td>1948</td>
<td>42</td>
<td>300</td>
</tr>
<tr>
<td>1949</td>
<td>44</td>
<td>25</td>
</tr>
<tr>
<td>1950</td>
<td>42</td>
<td>37</td>
</tr>
<tr>
<td>1951 Sept.</td>
<td>4</td>
<td>38</td>
</tr>
<tr>
<td>1952 Sept.</td>
<td>34</td>
<td>No observations made</td>
</tr>
<tr>
<td>1952 Oct.</td>
<td>40</td>
<td>11</td>
</tr>
<tr>
<td>1953 May</td>
<td>21</td>
<td>20</td>
</tr>
</tbody>
</table>

The large number of carcasses found after the 1948 campaign was due to lack of experience which resulted in baits being dropped on station properties and near to settlements. In later campaigns the baits were dropped more accurately on the most inaccessible places. However, the following facts are of interest:

A group of five dogs was seen during the 1949 campaign and five carcasses were found nearby shortly afterwards. During the October, 1952, campaign the following groups of dogs were seen from the plane: six at Lake Carnegie, three at Abydos and three at Perry Springs near Meekatharra. Subsequently four carcasses were found at Lake Carnegie, three at Abydos and three at Perry Springs near where the dogs were sighted. One cattle station which had not produced more than nine dog scalps in any year for some time, suddenly produced 60 scalps after a baiting flight had passed near its boundaries.

Thirty scalps were obtained from carcasses found near where baits were dropped along a river in the September, 1951, campaign in the Kimberleys. The finder (who was unaware of the baiting) reported that an outbreak of disease must have occurred among the dogs as very few were left alive.

Owing to shortages of men it was not possible to make any observations or follow up results in the October, 1951, campaign.

**Decreases in Scalps Produced.**

Numbers of scalps produced in the Vermin Districts mainly involved in the baiting were as follows:

<table>
<thead>
<tr>
<th></th>
<th>1945</th>
<th>1946</th>
<th>1947</th>
<th>1948</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scalps from Vermin Boards most concerned</td>
<td>3,073</td>
<td>2,087</td>
<td>2,187</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1946</td>
<td>1947</td>
<td>1948</td>
<td></td>
</tr>
<tr>
<td>Scalps from other Vermin Boards in area</td>
<td>755</td>
<td>614</td>
<td>699</td>
<td></td>
</tr>
<tr>
<td>Totals for area</td>
<td>3,828</td>
<td>2,701</td>
<td>2,886</td>
<td></td>
</tr>
</tbody>
</table>
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The "Vermin Boards most concerned" are Ashburton, Marble Bar, Meekatharra, Nullagine, Port Hedland, Roebourne-Tableland, Upper Gascoyne, Wiluna, and the "Totals for area" were taken from the statistical divisions of Northern Goldfields and North-West and the southern part of the Northern division.

The figures do not show any great reduction. However, there may be some significance in the fact that there has been a greater reduction in scalp numbers from the districts where aerial baiting was carried out than in neighbouring districts. The picture is clouded by other factors such as the very localised variations in seasonal conditions which are encountered in these areas. Also, the work of the Government doggers has been much better organised by having decentralised control. During the 12 months ended 30th June, 1953, the Government doggers obtained a record number of 1,000 of the 5,000 scalps produced in pastoral areas excluding the Kimberleys. The planning of the aerial baiting has been so closely integrated with the work of the men on the ground that it is difficult to assess the results separately.

One of the Department's doggers had been operating in the Hamersley Ranges for a number of years. Owing to the difficulties of penetrating these ranges, which are well known as a prolific breeding area, the dogger kept a line of traps around the foothills and his average catch was between 30 to 40 dogs a month. The ranges were heavily baited in each campaign and the average catch of this dogger dropped to nine a month. He raised objections to the aerial baiting and even went to the extent of saying that where baits were dropped in the vicinity of his traps he could not trap any dogs. He finally resigned. Stations in the baited areas reported decreases in dogs and foxes following the baiting.

Reports of Decreases in Sheep Losses or in Wild Dog Numbers Questionnaire.

A questionnaire was sent to various pastoralists on the baited areas asking for information, including decreases in sheep losses attributable to the baiting.

In the 20 replies received, all agreed that aerial baiting was a great advance in wild dog destruction methods. Only four stations reported big decreases in sheep killing attributable to the baiting, five more reported some decreases in dog and fox populations, and several mentioned the finding of dog carcasses. Most stated that seasonal conditions and influxes of dogs from inland districts prevented a true assessment of results.

Other Reports.

Immediately after the first aerial baiting in the West Kimberleys (September, 1951), three stations reported a complete cessation of dog attacks which had been continuous up until then. A period of three months elapsed before sheep killing recommenced.

The manager of another station in the West Kimberleys reported in June, 1953, that dogs were still not as numerous where baiting had been carried out in September, 1952, although they had not decreased elsewhere.

In July, 1953, a station-owner in the North-West stated that all the dogs and carcasses observed by him on or about his property during the past year had been adults. He considered that aerial baiting had destroyed the pups from the season's litters.

Fig. 7.—Portion of the coast north of Roebourne. Numbers of foxes were destroyed by baits dropped in the coastal sandhills

LOCAL AERIAL BAITING SCHEMES

A number of Vermin Boards and stations have conducted private aerial baiting projects. The West Kimberley, Meekatharra, Upper Gascoyne, Ashburton, Roebourne and Tableland, Wiluna, Port Hedland, Marble Bar, Nullagine, Laverton, Leonora, Menzies and Black Range Vermin Boards have all conducted or shared in campaigns. Difficulties in organisation and the costs of "dead" flying to and from the districts from the aeroplane's headquarters have deterred the Boards from continuing. Most
### AERIAL BAITING.
#### DETAILS AND COSTS.

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<tbody>
<tr>
<td></td>
<td>October</td>
<td></td>
<td>October</td>
<td></td>
<td>September</td>
<td></td>
<td>October-</td>
<td>May-June</td>
<td></td>
</tr>
<tr>
<td>Period of campaign</td>
<td>9 days</td>
<td>11 days</td>
<td>17 days</td>
<td></td>
<td>West Kimberley</td>
<td>2 days</td>
<td>19 days</td>
<td></td>
<td>11 days</td>
</tr>
<tr>
<td>Total miles flown</td>
<td>4,945 miles</td>
<td>6,926 miles</td>
<td>8,267 miles</td>
<td></td>
<td>General</td>
<td>19 days</td>
<td>9,587 miles</td>
<td></td>
<td>7,298 miles</td>
</tr>
<tr>
<td>Mileage over which baits distributed</td>
<td>3,370 miles</td>
<td>455,000</td>
<td>590,000</td>
<td></td>
<td></td>
<td>1,476 miles</td>
<td>8,255 miles</td>
<td></td>
<td>6,690 miles</td>
</tr>
<tr>
<td>Number of baits distributed</td>
<td>285,000</td>
<td>64 hrs. 25 mins.</td>
<td>62 hrs. 35 mins.</td>
<td></td>
<td></td>
<td>1,270 miles</td>
<td>7,544 miles</td>
<td></td>
<td>507,000</td>
</tr>
<tr>
<td>Number of flying hours on baiting</td>
<td>28 hrs. 5 mins.</td>
<td>51 hrs. 5 mins.</td>
<td>64 hrs. 25 mins.</td>
<td></td>
<td></td>
<td>13 hrs. 5 mins.</td>
<td>72 hrs. 10 mins.</td>
<td></td>
<td>350,000</td>
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<td>Expenditure—</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charter of aircraft</td>
<td>£433</td>
<td>£693</td>
<td>£827</td>
<td></td>
<td>£216</td>
<td>£1,032</td>
<td>£2,852</td>
<td></td>
<td>£1,095</td>
</tr>
<tr>
<td>Cost of manufactured baits</td>
<td>£880</td>
<td>£1,476</td>
<td>£2,632</td>
<td></td>
<td>£689</td>
<td>£2,491</td>
<td></td>
<td></td>
<td>£1,969</td>
</tr>
<tr>
<td>Estimated cost of baits prepared by Departmental doggers, etc.</td>
<td>£100</td>
<td>£120</td>
<td>£10</td>
<td></td>
<td>£200</td>
<td>£580</td>
<td></td>
<td></td>
<td>£331</td>
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<tr>
<td>Freight and sundries</td>
<td>£83</td>
<td>£67</td>
<td>£187</td>
<td></td>
<td>£10</td>
<td>£100</td>
<td></td>
<td></td>
<td>£150</td>
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<tr>
<td>Wages (estimated)</td>
<td>£60</td>
<td>£80</td>
<td>£100</td>
<td></td>
<td>£100</td>
<td></td>
<td></td>
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<td>£100</td>
</tr>
<tr>
<td>Total</td>
<td>£1,556</td>
<td>£2,436</td>
<td>£3,756</td>
<td></td>
<td>£1,115</td>
<td>£4,203</td>
<td>£4,860</td>
<td></td>
<td>£3,495</td>
</tr>
<tr>
<td>Less amount contributed by Vermin Boards, etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost to Department</td>
<td>£1,556</td>
<td>£1,513</td>
<td>£3,287</td>
<td></td>
<td>£439</td>
<td>£3,975</td>
<td>£4,860</td>
<td></td>
<td>£3,495</td>
</tr>
<tr>
<td>Cost to purchase and distribute each bait</td>
<td>1·3d.</td>
<td>1·28d.</td>
<td>1·52d.</td>
<td></td>
<td>2·05d.</td>
<td>2·1d.</td>
<td></td>
<td>2·3d.</td>
<td>2·39d.</td>
</tr>
</tbody>
</table>
CONCLUSIONS

(a) Baiting is recognised as the most effective means of large-scale wild dog and dingo destruction. It is a matter of making baits which the dogs will eat, each containing sufficient poison to kill a dog and placing them where dogs will take them.

(b) It has been amply demonstrated in the campaigns conducted that:

(i) Brisket fat baits gave the best results. Other materials were less attractive to the dogs.

(ii) The baits will kill dogs.

(iii) Trained personnel can and do drop baits where required, that dogs are taking them and are being killed.

(iv) Baits may be dropped from the air at less than 3d. each, while they cost 9d. to 2s. each to distribute from the ground.

(c) It is not considered that aerial baiting is as effective as ground baiting. Men operating on the ground have more time to observe tracks and signs and are able to place baits exactly where required.

(d) Where men are unobtainable or where areas are too inaccessible or too remote for men on the ground—and this includes many of the main breeding areas—aerial baiting affords an effective, and possibly the only, means of destroying wild dogs.

(e) It is preferable to use aerial baiting in close conjunction with, and in extension of, ground baiting.

(f) The nature of the country, time of the year, trained personnel, careful planning and preparation are all important factors.

(g) The areas baited—the North-West, Wiluna, Eastern Goldfields and the Kimberleys—are ideally suited for aerial baiting. The northern and inland country which has been covered is open, landmarks are readily visible and identifiable, watering places are comparatively limited and are recognisable from the air, while the driest period follows immediately after the pupping season.

(h) The more southerly parts of the State do not seem as promising, but a trial baiting is to be conducted in these areas early in 1954.

(i) The time of the year selected for the main campaigns in the North-West, North and inland areas is when the country is at its driest just before the summer rains. Wild dogs concentrate near watering places and present good targets. Pups are on the move and are not sufficiently experienced to avoid baits.

(j) Indications are that much good may also be done by baiting in the mating season—May and June. The dogs move out of their normal hide-outs on to the plains and open country and are more vulnerable. Furthermore, destruction carried out at this time reduces the natural increase. Sufficient success was achieved in the 1953 experiment to warrant further trials.

(k) Target baiting is considered generally more suitable than dropping continuous streams of baits.

(l) Many Vermin Boards and station-owners have recognised aerial baiting as an effective means of wild dog control, but the organisation of campaigns is too big a task for most of them.

(m) Carefully-planned aerial baiting campaigns closely co-ordinated with ground baiting, should be continued as they have been proved successful.
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