FIELD ACCEPTANCE OF NON-TOXIC AND TOXIC BAITS BY POPULATIONS OF THE BRUSHTAIL POSSUM (*TRICHOSURUS VULPECULA* KERR)

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SUMMARY: In four populations of possums more than 94 % of animals accepted each of the three types of dye-marked, non-toxic bait. In a fifth trial, conducted in summer, only 68 % of the population accepted bait. This poor level of acceptance was attributed to the abundance of natural food available, as indicated by the good condition of the animals. In a trial with toxic bait approximately 25 % refused either to eat a lethal quantity of toxic bait or to eat any toxic bait at all, compared with 98 % acceptance in the non-toxic control trial.

Reasons for possums surviving poison operations include: sub-lethal poisoning as a result of encountering and eating sub-lethal baits, or by sampling baits followed by aversion to the taste of the poison; olfactory aversion to toxic bait; inadequate distribution of baits; and infrequent visits by possums to the forest floor. The high acceptance rate of non-toxic bait types eliminates bait refusal as a major reason for operational failures, especially in winter.

INTRODUCTION

It took little over 50 years between the first major importations and liberations of the brushtail possum, *Trichosurus vulpecula* Kerr, at the end of the last century (Pracy, *1962)* and the realisation that the abundance of this animal, introduced into New Zealand for its fur, had reached pest proportions in many areas. Control measures were implemented in the mid-1950s, the most extensively used of which has been the aerial distribution of diced carrot bait impregnated with sodium monofluoroacetate (1080) poison (a substance whose properties were described by Rammell and Fleming (1978)). The technique was developed initially for the control of rabbits *(Oryctolagus cuniculus)* (Douglas, 1959*)* and appeared to be well suited to the control of possums. In fact, the degree of success achieved over the next 20 years varied considerably (Batcheler, 1978) and this promoted the belief that inadequate acceptance of bait was the major cause of failures. However, other factors may affect the success of aerial poisoning operations. Figure I is a schematic representation of how these factors are linked, their relationships in sequence of impact to each other, and the appropriate research required.

A series of field trials (Morgan, unpublished data) was conducted to test palatability of baits, thus fulfilling Stage 1 of the problem analysis. Palatability was defined as a relative measure of preference by an unknown proportion of the possum population. For carrot and three types of pellet bait, palatability was approximately equal, but some regional variation was found. Three of these bait types (carrot and two types of pellet) were selected for further assessment in this study and subsequent stages of the problem analysis.

Since palatability trials provide only an indication of how a possum population is likely to respond to bait used operationally, it was necessary to determine acceptance of the baits, defined as the proportion of

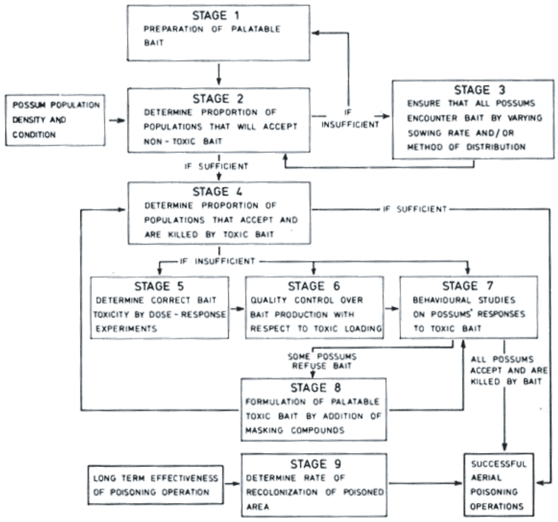

FIGURE 1. *Sequential problem analysis of factors that are considered to affect success and long-term effectiveness of aerial poisoning operations.*

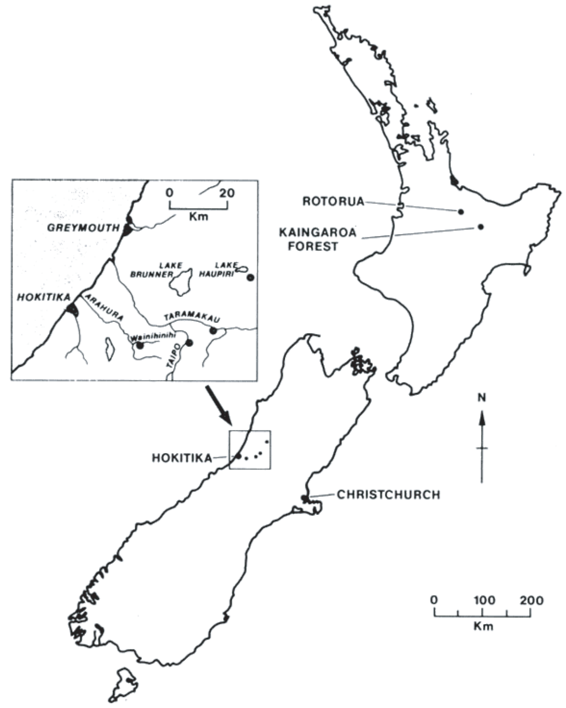

FIGURE 2. *Location of bait acceptance trials.*

a population that eats the bait offered. In this paper investigations into the acceptance of non-toxic and toxic baits (stages 2 and 4 in Fig. l) are described

Despite the apparent reduction of many populations by commercial possum hunters, there remain situations where low density possum populations may still present a problem but do not provide a good return for a hunter's efforts. Where these specific problems exist, such as the infection of a population with bovine TB (Cook and Coleman, 1975) or the gradual modification of the native flora of national parks (Wardle, 1977), control of local possum populations may still be necessary. In addition, since the buoyancy of the fur market cannot be guaranteed, improvement of control techniques is a wise precautionary policy that may well prove to have widespread application in the future.

METHODS

Study areas

The most widespread use of aerial poisoning in recent years has been in the forest-clad river valleys of Westland. Accordingly, four of the six acceptance trials were conducted in this area on populations of differing density and control history, whilst a young pine *(Pinus* sp.) plantation, a habitat type that is damaged by possums (Clout, 1977) was used for two further trials (Fig. 2).

The first trial in a series of non-toxic bait acceptance trials was conducted in the winter of 1978 on Mt Bryan O'Lynn south of Lake Haupiri in Westland. The vegetation and topography of this area, referred to later as Haupiri, are typical of central Westland hill country and, more particularly, of other Westland trial areas, and have been described by Coleman, Gillman and Green (1980). The plant' associations are dominated by southern rata *(Metrosideros umbellata)* and kamahi *(Weinmannia racemosa)* with a predominance of softwood podocarps and treeferns *(Cyathea smithii* and *Dicksonia squarrosa)* at low altitude, and broad leaf *(Griselinia littoralis)* and mountain 'cedar *(Libocedrus bidwillii)* in the upper forest zone.

At Haupiri, rectangular trial blocks, each approximately 1000 m x 200 m (20 ha) were marked out on four north-facing ridges spanning low, mid and high-altitude forest. The possum population here was considered to be of moderate to high density compared with that in other areas of Westland.

During spring 1978, a second trial was conducted in Taipo Valley, Westland. Four 40 ha blocks, each measuring 1000 m x 400 m, were delineated around west-facing ridges. The main objective was to study acceptance of non-toxic bait in a population that had been subjected to a control operation and commercial hunting over many years. Thus it was expected that the population density would be lower than that at Haupiri and that the possums would be less disposed to accept bait.

At Kaingaroa forest, two trials were conducted in similar seven-year-old *Pinus radiata* plantations during summer and the following winter of 1979. In each trial, four 50 ha treatment blocks of irregular shape on flat or gently undulating country were delineated by roads and marked trees. The larger block size of 50 ha was chosen because the population density was considerably lower than in Westland forests, and thus a larger area was required to provide an adequate sample of possums.

Finally, the south side of Taramakau Valley in Westland was chosen for a trial on a low density population. In summer 1979-80, four treatment blocks, each measuring 1000 m x 300 m (30 ha), were located on north-facing slopes because the ridges were generally too narrow to provide sufficient area of a single aspect.

During 1979, acceptance of toxic carrot bait was investigated in Westland. Three experimental blocks, each of 100 ha, were located on broad ridges on the east side of Wainihinihi Creek, a tributary of Arahura River. The larger block size was selected since the treatments of toxic bait were expected to reduce population densities.

Bait treatments and distribution

In each of the non-toxic bait acceptance trials four identical bait treatments were used at one treatment per block. These were: carrot, type-M pellets, type-7 pellets, and a mixture of approximately equal numbers of each bait type.

Carrot was cut by a Halde dicing machine, a Reliance, or a Gibson cutter, and in all cases then screened over a 22 mm mesh. Type-7 pellets were manufactured by the Agricultural Pests Destruction Council by the extrusion of a wet mixture of pollard, wholemeal flour, 0.01 % wt/wt lissamine green dye, sugar and jam, then sliced into cylindrical pellets and dried to produce pellets of mean weight 6.5 g, mean length 26 mm and approximately 14% moisture content. Manufacturing details of the type-M pellet, produced by Fruitgrowers Chemical Company Limited, are not available but they were about the same size as type-7, had a mean weight of 3.4 g and were also dyed green.

A technique was developed (Morgan, 1981) that revealed the proportion of possums in a population that had eaten bait. The technique involved the application of Rhodamine B dye (a brilliant-red dye which fluoresces under ultra-violet light) at a concentration of 0.5% wtjwt on to the surface of baits. A concrete mixer was used to dye carrot bait, and pellets were dyed as the final stage in their manufacture.

In the toxic bait acceptance trial, three treatments of carrot alone were used. These were non-toxic carrot and carrot impregnated with 0.1 % and 0.2 % wt/wt of 1080 in solution. Rhodamine B was also added at the rate of 0.5 % wt/wt.

Helicopters equipped with 'Gardners' sowing buckets were used in all trials to distribute bait. To maximise the chances of possums encountering baits a high sowing rate was used that would theoretically disperse bait at a density of 1 bait/2m^2 on the ground. Quantities of bait used to achieve this distribution were: 17 kg/ha of type-M pellets, 32.5 kg/ha of type-7 pellets, 13 kg/ha of carrot, and a third of each quantity for the mixture treatment. From calibration flights it was found that, when flying at 40 knots and a height of 15 m above the canopy, the pilot was able to achieve accurate and uniform distribution of the bait at this density over most of each block.

Where no other features indicated the boundary of a block large brightly coloured balloons, filled with a mixture of helium and nitrogen, were secured by light gauge fishing nylon to a tree, and allowed to float above the forest canopy at strategic positions.

Capture and autopsy of possums, and assessment of bait acceptance

After the bait had been distributed in each trial, two nights were allowed for possums to eat it. Over the next five nights an intensive effort was made to capture a large number of possums from each block. Initially each block was treated by hand-laid cyanide paste lured with rose-oil or flour flavoured with curry powder. From the fourth until the seventh night after sowing, approximately 150 gin traps were also set in each block, giving approximately 2400 trap nights in each trial location.

Since lured cyanide might selectively kill possums that had accepted the dyed bait, the gin traps were used without lure for comparison. Traps were set in recesses on the ground or at the base of trees, camouflaged with leaves and twigs and surrounded by guiding logs. Trapping did not start at the same time as poisoning so the two catches cannot be compared statistically. However, since exactly the same proportion (58%) of both the bait acceptors and refusers were caught by poison over all trials, and 42 % by traps, it would appear that cyanide poison did not kill selectively.

All animals were classified as either bait acceptors or refusers after searching their forepaws, snout, mouth and gut for Rhodamine B dye. Where no evidence of dye was found, forepaws were later inspected under high-intensity (360 nm) ultra-violet light. A 5m radius around each dead animal was searched for baits to ensure that it had been exposed to bait.

Of 1367 possums caught, 66 were in areas devoid of bait and although the majority were clearly marked with dye, this portion of the sample was not included in the analysis, since it is possible that some may have been captured or killed without encountering bait. Juvenile animals, still dependent on their mothers, were also excluded from the analysis. Second and third molar teeth were taken from the lower jaw of each animal for later ageing from counts of cementum layers (Clout, 1977). Each animal was weighed and measured to determine mean condition for each population as described below.

Results from the five non-toxic bait acceptance trials were analysed by two-factor analysis of variance (i.e. population; bait type), and where signifycance occurred, by Duncan's Multiple Range Test.

Possum population density and condition

The effectiveness of aerial poison operations is influenced by the population density and condition of the animals (Batcheler, Darwin and Pracy 1967; Bamford and Martin, 1971).

Possum population density was subjectively assessed in each trial area as being low, medium, or high. Because the same capture effort was applied in each area, a relative estimate of population density is provided by the number of possums caught per unit area. At Haupiri, an overall absolute density, covering the range of habitats encompassed in this study, was calculated, from data summarised in Coleman *et al*. (1980), to be 7.0 possums/ha. Thus an estimate of absolute density can be approximated for all other areas by simple proportion.

Condition is influenced by the amount and quality of food ingested and can be assessed from physical size, growth rate and fat reserves (Boersma, 1974). Condition was assessed from the size and growth of animals by developing weight/length equations for each population from linear regressions of the natural logarithms of body weight (W) in grams (to the nearest 50 g) and total length (L) in centimetres (Bamford, 1970). The relationship is thus of the form $10g_eW=b\ 1og_eL + log_ea$, or $W=aL^b$ where a is a constant. The slope (b) of each regression is an index of the mean growth characteristics of the population (Taylor, 1979) and it is used here as a relative index of population condition.

Challies (unpublished data), in assessing condition of deer populations, showed that season of sampling and differences in population age structure and sex ratios may all affect such assessment. In this study, comparison of populations at different times of year was deliberate and hence seasonal effects may well be combined with the other environmental parameters that determined condition of the different populations. Since young animals are more sensitive to environmental fluctuations than adults, animals of less than two years age were removed from the analysis as a likely source of heterogeneity. Population sex ratios were found by Student's "t" test to differ significantly ($P < 0.05$), and so slopes were calculated separately for the sexes, and a weighted mean slope then calculated for each population.

Analysis of covariance was used to develop the, regressions and test for variation in population slopes, and Duncan's Multiple Range Test for unequal replications (Steel and Torrie, 1960; p. 114) was used to rank the weighted mean slopes and further analyse the differences.

RESULTS

Bait acceptance

Table 1 summarises the results of bait acceptance in each of the five non-toxic bait trials. Altogether, 49 animals were excluded from the analysis of non-toxic bait acceptance regardless of whether they were marked by dye or not.

In the Haupiri and Taipo trials, virtually all animals ate non-toxic bait, regardless of the type encountered; very high proportions (> 90%) accept-

TABLE 1. *Summary of non-toxic bait acceptance trials. Numbers and percentages of possums caught and marked by dye.*

	Haupiri (winter)			Taipo (spring)			Kaingaroa (summer)			Kaingaroa (winter)			Taramakau (Summer)		
	Caught	Marked	%	Caught	Marked	%	Caught	Marked	%	Caught	Marked	%	Caught	Marked	%
Type- M	98	98	100	52	50	96.1	30	24	80.0	35	34	97.1	96	95	99.0
pellets	(1)												(12)		
Type-7	157	157	100	78	77	98.7	55	46	83.6	25	25	100	40	38	95.0
pellets	(1)			(2)			(5)						(6)		
Chopped	116	116	100	22	22	100	52	30	57.8	70	64	91.4	81	74	91.4
carrot	(3)			(3)			(5)			(1)			(6)		
Mixture	78	78	100	43	43	100	35	17	48.6	25	23	96.0	39	39	100
							(3)								
Total	449	449	100	196	192	97.9	172	117	68.0	154	146	94.8	256	246	96.1
	(5)			(5)			(13)			(1)			(25)		

Figures in brackets indicate animals caught at sites where no bait was found within a 5m radius. These animals were excluded from analysis.

TABLE. 2. *Analysis of variance of non-toxic bait acceptance data.*

	SS	DF	F	P
Population (P)	0.7392	4	10.06	0.0008
Bait treatment (B)	0.0216	3	0.39	0.7607
P x B	0.2205	12		
Total	0.9814	19		

Duncans multiple range test of 'Population' factor: Kaingaroa (summer) < Kaingaroa (winter) = Taramakau = Taipo = Haupiri (P = 0.01).

ed bait in the Kaingaroa winter and Taramakau trials; . but only moderate proportions (49-80%) in the Kaingaroa summer trial ate bait. Analysis of the data (Table 2) shows that acceptance was significantly lower (P < 0.01) in the Kaingaroa summer trial than in all the others (which were statistically similar), and that overall~ there was no significant difference in acceptance of the four bait treatments.

A detailed demographic analysis of the data was not possible, or in fact necessary, due to the low proportions of animals refusing bait in all but one of five non-toxic trials. However, proportionately more of the bait refusers were female, and proportionately more of the refusers were young animals less than two years old (Table 3).

Results of the toxic bait acceptance trial at Wainihinihi Creek are shown in Table 4. Virtually all possums (98 %) ate carrot in the non-toxic treatment block, as found in other Westland trials. Assuming the population density of these three treatment blocks was the same, the numbers of animals caught on the 0.1 % 1080 and 0.2% 1080 treatment blocks suggest that around 32 % and 17 % respectively of the populations survived. From the two toxic treatments, 41 % of the survivors showed some evidence, usually very slight, of Rhodamine B dye indicating that they had survived a sub-lethal intake of bait. The remaining 59 % of the survivors, showed no evidence of the dye and must have refused to eat the bait altogether, although they must have encountered bait since its distribution was similar to that in the non-toxic treatment block.

Comparing the data from the two toxic treatment blocks, proportionately more animals survived by refusing to eat carrot in the 0.2 % treatment area than in the 0.1 % area. Of the animals that survived after eating toxic bait, none of those captured in the 0.2 % treatment area were estimated to have eaten an entire average sized bait (for assessment technique see Morgan (1981). However, it was not possible to replicate the toxic bait acceptance trial and the data must be regarded as indicative rather than definitive.

TABLE 3. *Acceptance and refusal of bait in five non-toxic bait trials by possums of different sex and age.*

	Acceptors (%)	Refusers (%)	Total
Male	516 (95.4)	25 (4.6)	541
Female	648 (92.8)	50 (7.2)	698
			1239
Young (≤ 2 yrs)	549 (93.5)	38 (6.5)	587
Old (≥ 3 yrs)	615 (94.3)	37 (5.7)	652
			1239

TABLE. 4. *Summary of toxic bait acceptance trial, Wainihinihi Creek*

Treatment	Number caught	Number marked	% total population surviving[1]	% survivors eating > 1 piece carrot	% survivors eating < 1 piece carrot	% survivors refusing carrot	% total population eating carrot[2]
Non-toxic	94 (3)	92	100	98	0	2	98
0.1 % 1080	30 (3)	17	32	17	40	43	86
0.2% 1080	16 (12)	4	17	0	25	75	87

Figures in brackets refer to animals caught at sites where no bait was found within a 5 m radius. These animals were excluded from the analysis.

[1] Assuming equal population densities prior to poisoning and equal catch efforts in each treatment block.

[2] For toxic treatments calculated as follows:
% total population eating carrot = (% killed by toxic carrot) + (% total population surviving marked)

TABLE 5. *Capture returns and population densities* in *each trial area*.

	Haupiri	Taipo	Kaingaroa (summer)	Kaingaroa (winter)	Taramakau	Wainihinihi
Total number of possums caught	454	201	185	155	281	97*
Total area (ha)	80	160	160	200	120	100
No. possums caught per ha	5.7	1.3	1.2	0.8	2.3	1.0
Estimate of absolute density	7.0+	1.5	1.5	1.0	2.8	1.2

* Total number of possums captured in non-toxic treatment block only used.
+ Calculated from data summarised in Coleman *et al* (1980).

TABLE 6. *Weighted mean (of the two sexes) slopes of log length/log weight regression for possum populations* in *the six trial areas, and ranking of slopes (from best to poorest condition.).*

Population	Weighted mean slope
Haupiri	2.7878
Taipo	2.1822
Kaingaroa (summer)	3.0063
Kaingaroa (winter)	3.0916
Taramakau	2.6757
Wainihinihi	1.7316

Kaingaroa (winter) > Kaingaroa (summer) > Haupiri > Taramakau > Taipo > Wainihinihi (P = 0.05)

Population densities and condition

The number of animals caught in each area is shown in Table 5, and the absolute densities are calculated from these data. Since a mean of 5.7 possums/ha was caught over the capture period at Haupiri, and a density of 7.0 possums/ha was calculated from other data (Coleman *et al.,* 1980), it would appear that a little over 80% of the possums in each population were caught during the five day intensive capture period. Densities as revealed, confirmed the subjective assessments of relative density that were made prior to each trial.

Condition, considered separately for both sexes, was found to differ significantly (P < 0.00 l) between populations (Table 6). Both the summer and winter populations at Kaingaroa were in better condition than the Westland populations. Surprisingly, the possums caught in winter at Kaingaroa were in significantly better condition than those caught in summer.

DISCUSSION

Over the last 25 years poor success in many poisoning operations has led forest managers to assume that a major cause for failure was that some possums simply did not like the (non-toxic) bait material. Consequently, a considerable effort has been devoted to producing more palatable baits. The results from the present series of trials show that dislike for the non-toxic bait material is unlikely to be the major cause of failure in most winter poisoning operations.

The first trial at Haupiri produced a very clear result from a large sample of animals. All 449 possums caught in the vicinity of baits had eaten some. The moderately high density of 7.0 possums/ha may well have intensified competition for food in this population, thus explaining the complete acceptance of bait.

High levels of bait acceptance were also found in the Taipo and Wainihinihi populations, in trials con ducted in winter and spring respectively. Although both populations were at low density, the relatively poor condition of the animals indicates a poor nutritional plane which may have predisposed them to accept bait.

In only the Kaingaroa summer trial was there a significant proportion of the population that did not eat the non-toxic bait offered. The Kaingaroa population is typical of the low density, relatively high condition populations found in pine plantations (N. Gibbs, pers. comm.). In such habitats population density is most probably controlled by the availability of nest sites rather than food. Although the diversity of food sources is less than in most other habitats (Warburton, 1978), many of the plants, such as pine pollen, bracken, tutu *(Coriaria arboreal* and a variety of grasses, are highly nutritious (Clout, 1977). Thus, as expected, the Kaingaroa population showed the poorest level of bait acceptance, especially in summer. However, since control operations are not usually conducted in summer, this is not a troublesome result.

The winter trial conducted at Kaingaroa was designed to show if the population would be more inclined to accept bait in winter when natural food supplies are less nutritious. Overall, the percentage of animals there accepting bait increased from 68.4 % in summer to 94.8% in winter, although body condition in winter was found to be highest of all six populations.

Because the Kaingaroa summer trial had yielded such an interesting result, a further trial was conducted in summer with a low density population in Taramakau Valley, Westland. This population had been maintained at low density, not by lack of nesting sites, but by habitat deterioration caused by the formerly high possum densities, poisoning by the New Zealand Forest Service in 1961, and sustained commercial hunting. During late summer, it was expected that this population would be in peak condition (Bamford, 1970) but it was, in fact, only of average condition. Although 96 % acceptance of all bait treatments was extremely high, approximately 9% of animals refused to eat carrot bait, as was also found at Kaingaroa in winter. Though carrot bait was not found to differ significantly from other bait types overall ($P = 0.76$), these findings suggest that pellet baits may be marginally more acceptable than carrot bait.

In considering the predictive value of population density and condition, Batcheler *et al.* (1967) suggested that where population density is 5 possums/acre (i.e. 11/ha) or less, then kills of 90% or more are unlikely. The results of the present trials show that acceptance of non-toxic bait by more than 90 % of the population can be expected even when animal density is very low (i.e. < 2 possums/ha). Condition, which reflects the combined effects of all environmental stresses, was shown by Batcheler *et al.*, (1967), to be negatively correlated with poisoning success. Whilst the results of the present study support these earlier studies to some extent, I believe a more precise indication of animal condition is required for assessing current welfare. Depletion of fat reserves and consequent changes in length/weight relationships may be expected to lag behind changing environmental conditions, and this was indeed so at Kaingaroa. A more immediate measure of environmental stress, and hence predictor of bait acceptance, may be changes in weight of the thymus gland (Ozoga and Verme, 1978) but this has not been tested in possums.

An indication of why some possums survive aerial poisoning operations is given by the results of the Wainihinihi Creek trial. There, non-toxic bait was eaten by virtually all animals that encountered it, reaffirming the evidence from non-toxic bait trials that conventional bait materials are generally acceptable to possums. Of the animals which were captured in the two toxic treatment areas, 41 % had survived a sub-lethal dose, as indicated by minor traces of Rhodamine B dye within the gut. These animals must have survived for two reasons. Firstly, they may have found the toxic bait unpleasant to taste by virtue of the 1080 poison, and hence only nibbled the bait; or they may have encountered a sub-lethal bait, eaten it, and lost their appetite before encountering other baits. The majority of survivors, that is 59 %, from the two blocks where toxic carrots were sown showed no evidence of having eaten bait. Since they are assumed to have encountered it, refusal appeared to result from an aversion to the bait by sense of smell. In support of this argument the results show that a higher proportion of survivors were caught in the area where the 1080 concentration on bait was higher. However, the greater proportion of possums surviving through olfactory aversion in the 0.2 % treatment area is also enhanced by fewer animals surviving after eating small quantities of the more toxic bait. These findings have led to a more detailed investigation of the behavioural response of possums to baits (as indicated by stages 7 and 8 of Fig. 1) and early results (unpublished data) tend to confirm the conclusions drawn from the Wainihinihi Creek trial.

There remains the possibility that possums survive poisoning operations because they never encounter bait. Although great effort was made to distribute baits evenly and accurately in these trials, records made during the capture of possums showed that of 1367 animals caught, 66 (4.8%) were caught at sites where no bait was found within a 5 m radius. In many instances unbaited areas of much larger radius were obvious. In routine operations where the pilot is often unfamiliar with the target area, the distribution of baits would be even less uniform. Also, since fixed-wing aircraft, with their larger capacities and cheaper operating costs, are normally used, their poor manoeuvrability compared with helicopters will compound the difficulty of achieving effective sowing.

There is also a possibility that some animals may spend very little time on the ground (Ward, 1979) and hence be less likely to encounter toxic baits. The present series of trials has not assessed this, but it could be significant depending on the habitat type and distribution of food plants. I suspect that such animals would not differ in their response to bait compared with those that use the ground. However, assuming that some animals may be mainly tree-dwelling, it will be necessary to develop potent lures to attract them from the canopy to baits on the ground. Studies with lures are now being done, predominantly in relation to the masking of the smell of 1080 poison.

These results lend support to the normal practice of conducting aerial control operations in late winter when the animals are expected to be in poorest condition. Provided that one of the bait types tested in this study is used, acceptance of non-toxic bait would be expected to be very high even in low density populations. However, there is growing evidence that 1080 poison deters many possums from eating a lethal, or any, quantity of bait. Thus, research into possum control is now being directed towards the toxic bait and its interaction with the possum. The determination of varying toxic susceptibilities of possums, and improvement of the precision with which toxic baits are being prepared, are expected to minimise the likelihood of sub-lethal poisoning occurring, while studies of the behavioural response of possums to toxic baits are expected to provide methods of overcoming the bait-aversion phenomenon.

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