

WILDLIFE HAZARDS FROM 1080 BAITING

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ONE-SHOT oat baiting with sodium fluoroacetate (1080) is a relatively safe method of trail baiting rabbits. The hazard to wildlife is small and every effort is made to further reduce the hazard by selective application of the poison.

Economical and effective rabbit control in Western Australia is dependent on one-shot baiting with 1080. The other main poisons that have been used for rabbit control, phosphorus and strychnine, are repellent to rabbits or bitter tasting, so that it is necessary to pre-feed on several occasions before laying poison.

Because 1080 is soluble, odourless and tasteless, it can be applied in a one-shot method which saves labour. In most cases, kills by this method are equal to those obtained by the conventional method of three pre-feeding and one poisoning operations.

Poisoning costs with one-shot 1080 are about the same as the less effective phosphorus method, but the cost of strychnine poisoning is seven times greater.

Use of 1080 in W.A.

The first usage of 1080 in W.A. was in experimental work at Manjimup in 1953. It came into general use for rabbit control in 1956.

In W.A., nearly all the 1080 used is handled and laid by trained staff of the Agriculture Protection Board.

In 1969, 73,995 mixes of one-shot bait were applied by Agriculture Protection Board staff and only 885 conventional mixes were left with farmers. A mix in each case represents 16 lb. of bait material.

Toxicity

The toxicity of 1080 varies with the animal species concerned and the size of the animal. Rabbits are relatively susceptible when compared with domestic livestock. Table 1 shows the quantities of 1080 required to kill various animals of the approximate body weights shown. A more extensive list appears in Table 2.

Apart from the adjustment of dosage, some selective kill is assured by using a bait which is unattractive to animals other than the

Table 1.—Lethal doses of 1080.

Animal or bird	Approx. body weight (lb.)	Amount 1080 to kill (mg.)
Fox	14	0.4
Cat	11	1.0
Dog	32	1.0
Rabbit	3½	1.2
Sandy Wallaby	32	6.4
Sheep	110	25
Fowl	4	12
Cow	600	66
Toad	¼	62
Man	154	140
		(35 considered dangerous)
Red Kangaroo	70	280
Horse	1,000	400

target species. Oats is the main bait used for rabbits in W.A. A survey in Tasmania showed that oats was more selective than apple, carrot or bran and pollard, and there is no reason to suspect that this does not hold for W.A.

Fauna losses

In 1960 and 1964, the Agriculture Protection Board conducted a survey amongst members of its staff to assess the number of reported cases of fauna seen feeding on 1080 trails, and the outcome.

In 1960, the 1080 was applied in the conventional form of three pre-feeds followed by poison, while the 1964 survey related to one-shot baiting. Oats were used in nearly all cases.

The only species of native fauna which has been killed in any numbers by 1080 poisoning is the wood duck (or maned goose). On a few occasions flocks of up to 20 have been found dead near dams.

This bird is one of the few wild ducks which is predominantly a grain feeder. In spite of these initial losses, this species is multiplying

Table 2.—Acute toxicities of 1080.

ANIMAL	ROUTE	MORTALITY %	DOSAGE mgm/kg
Toad	i.p.	50	500
Mouse (house)	Or.	50	8.0
Rat (Norway diff. strains)	Or.	50	0.22—3.0
Guinea pig	s.c.	100	0.25
	i.p.	50	0.35
Rabbits (various)	i.v. or s.c.	50—100	0.25—1.0
Hamster	i.p.	50	3.0
Gopher (pocket)	i.p.	100	0.05
Ground squirrel (diff. strains)	i.p.	50	0.4—0.9
Cat	i.v.	50	0.2
Dog	i.v.	50	0.06
	i.v.	100	0.1
	Or.	50	0.066
Coyote	i.p.	50	0.1
Monkey (Rhesus)	i.v.	50	4.0
Monkey (Spider)	i.v.	50	15.0
Goat	i.m.	50	0.6
Horse	Or.	50	1.0
Pig (adult)	Or.	50	1.0
(young)	i.p.	50	0.4
Sheep	Or.	50	2.0
Cattle	Or.	50	0.2
Chickens (various)	Or.	50	5.0—7.5
Pigeons (various)	Or.	50	2.5—9.0
Eagle	Or.	50	5.0
Quail	Or.	50	20.0
Sparrow	Or.	50	2.5
Vulture	Or.	50	15.0
Hens	Baits	50	10.0
Deer mice	Baits	50	5.0
Wood rat	Baits	50	5.0
Norway rat	Baits	50	5.0
White rat	Baits	50	2.5
Prairie dogs (Black tailed)	Baits	50	2.5
Meadow mice	Baits	50	0.5
Dogs (domestic)	Baits	50	0.35
Ground squirrel	Baits	50	0.35
Black rat	Baits	50	0.1
Frog	Or.	50	300
Rats (various)	Or.	50	1.0—7.0
Chicken (R.I.R.)	Or.	50	10.0—30.0
Sheep	Or.	50	0.25—0.5
Sandy Wallaby	Or.	100	0.4
Red Kangaroo	Or.	100	8.0
Rabbits (Wild—W.A.)	Or.	100	0.8
Man (death)	Or.	2.0—6.0
Man (dangerous)	Or.	0.5

Or. — Orally (by mouth)
i.p. — Intra-peritoneal (into the abdominal cavity)
i.v. — Intravenous (directly into the bloodstream)
s.c. — sub-cutaneous (under the skin)

rapidly and becoming a pest to some farmers because of the way in which it fouls water supplies. Since an instruction was issued to avoid laying poison near dams, these losses have been considerably reduced.

In the early 1960s, trials were undertaken to see if grey kangaroos could be deliberately poisoned with 1080. These trials extended over several months in areas where kangaroos were present in relatively large numbers. Different bait material including apples, carrots and oats were used. It was concluded from these trials that it was most unlikely that 1080 laid for rabbit control would be responsible for the deaths of grey kangaroos.

It is significant that a decline in the population of native marsupials, such as possums, bandicoots and quokkas, occurred in the south-west of Western Australia in the 1920s as rabbits invaded the area and started to increase in numbers. Marsupial numbers have been building up ever since a reduction in the rabbit population started with the introduction of 1080 in conjunction with myxomatosis in 1956. While other explanations, such as disease, have been advanced as the reason for the fall in marsupial numbers, the subsequent rise in numbers when rabbits were reduced cannot be entirely coincidental.

Pollution of waters

Some concern is often expressed on account of the possible pollution of waters caused by the distribution of 1080. A look at some basic figures will dispel any fears in this regard.

In the heaviest rabbit infestations, 1080 bait is laid at a rate of approximately 6 miles of

trail per 100 acres. In the lower South-West areas, where rates of lay are highest, this amounts to approximately 1.7 ounces of 1080 per 100 acres. In the worst possible situation whereby all the poison is washed into a creek by 1 inch of rain, then there is 1 mg. (0.00035 oz.) of poison in every 46 gallons of runoff water. Under these conditions, a 32 lb. dog would have to consume 46 gallons of water, a 4 lb. fowl 552 gallons, and a 10 stone man 6,240 gallons, to obtain a lethal dose. It is reported that fish are unaffected by 1080 in the water in which they swim.

1080 does not accumulate in the body as do many insecticides. It is all metabolised or excreted from the body in 3 to 4 days. Although the poison is very stable chemically, bacteria do exist that will render it non-toxic. The quantities applied per acre are relatively small, and it is doubtful if any appreciable quantities reach the sea.

Secondary poisoning

Some carnivores are poisoned by eating carcasses following rabbit control operations. Foxes, dogs and cats, because of their great susceptibility to the poison, are at risk.

The number of foxes in the agricultural areas has been drastically reduced by 1080 during the last 15 years. There are two reasons for this. Firstly, dramatic reduction in rabbits has reduced the foxes' food supply, while secondary poisoning has directly accounted for considerable numbers of these pests. Farm dogs are also susceptible to poisoned rabbit carcasses.

POWDERY MILDEW OF CUCURBITS

Severe powdery mildew attack is common on cucumbers, rock melons and other cucurbits during summer and autumn. Yields are reduced and the fruit is spoilt by sunburn.

Susceptible varieties should be sprayed with fungicide at the first sign of mildew and every 10 days thereafter. Benlate*, Karathane* and Morestan* should be applied according to manufacturer's recommendations, and the withholding period between the last spray and harvest observed.

Morocide* is not recommended for use on cucurbits. It was inadvertently included in a previous list of fungicides for the control of powdery mildew published in the October, 1970, issue of this Journal.

*Registered trade name.