

## **NATSOP-RAB001 NATIONAL STANDARD OPERATING PROCEDURE: GROUND BAITING OF RABBITS WITH SODIUM FLUOROACETATE (1080)**

Voluntarily adopted by the Vertebrate Pest Committee 2012 with the Invasive Plants and Animals Committee endorsing minor updates September 2017.

### **BACKGROUND**

Poisoning with 1080 is used to minimise the impact of the introduced European rabbit (*Oryctolagus cuniculus*) on agricultural production and the environment. Other rabbit control methods include poisoning with pindone, warren fumigation, warren and harbour destruction, shooting, trapping, exclusion fencing and biological control with rabbit haemorrhagic disease virus (RHDV) and myxomatosis.

Poisoning with sodium monofluoroacetate (1080) is one of the most effective methods of quickly reducing rabbit numbers and is usually performed prior to harbour destruction and warren fumigation. 1080 is an odourless, tasteless white powder that has a special dye added for identification of the toxin. It is used for poisoning of rabbits by incorporating it into a suitable bait material. Poison bait is offered either as a concentrated trail or broadcast (scattered) in a swathe on the ground or from the air. Aerial baiting procedures are described in [NATSOP-RAB002 National Standard Operating Procedure: Aerial baiting of rabbits with sodium fluoroacetate \(1080\)](#).

'Conventional' poisoning methods use free-feeding with unpoisoned bait on 2 to 3 occasions, usually 3 to 4 days apart, prior to laying poisoned baits. The 'one-shot' oats technique requires no pre-baiting.

Rabbits are moderately susceptible to the effects of 1080; however other species, especially some native animals and birds and domestic livestock are also vulnerable to poisoning. Good baiting technique helps to minimise the risk to non-target species and maximise the effect on targeted rabbit populations.

This National Standard Operating Procedure (NATSOP) is a guide only; it does not replace or override the legislation that applies in the relevant state or territory jurisdiction. The NATSOP should only be used subject to the applicable legal requirements (including OH&S) operating in the relevant jurisdiction.

### **APPLICATION**

- Baiting with 1080 should only be used in a strategic manner as part of a coordinated program designed to achieve sustained effective control.
- Poisoning is used as an initial control method to reduce high rabbit populations to a more manageable level. Fumigation and ripping of warrens are then used as follow-up techniques to reduce harbour and to slow re-colonisation. Poisoning is also an important management tool in areas where rabbits are mainly surface dwelling or where it is too difficult to rip warrens.
- Controlling rabbits with 1080 bait cannot be undertaken in areas where there is an unacceptably high risk to humans and/or companion animals, such as urban/residential environments.
- 1080 use is restricted in areas where there is a high risk of poisoning domestic stock and wildlife.
- Because water reduces the concentration of 1080 in bait, poisoned bait should be laid when the ground surface is dry and there is a low chance of rain within several days of laying.
- Although poisoning programs can be carried out year-round, baiting is most effective when alternative food for rabbits is scarce i.e. at the end of summer or early autumn.
- Baiting may be less effective when feed supply is abundant and also during the breeding season when juvenile rabbit movements may be limited and they are less likely to find the bait.

## **NATSOP-RAB001 NATIONAL STANDARD OPERATING PROCEDURE: GROUND BAITING OF RABBITS WITH SODIUM FLUOROACETATE (1080)**

Kittens over 17 days old can survive even if the mother is poisoned and subsequent breeding by these survivors can cause rapid recovery of the population

- Baiting of rabbits with 1080 can only be carried out under conditions set down in a specific permit issued by the Australian Pesticides & Veterinary Medicines Authority (APVMA) under Commonwealth legislation (Agricultural and Veterinary Chemicals Code Act 1994). 1080 must also be used in accordance with relevant State, Territory and other Commonwealth legislation. The 1080 user may need to make a referral under the EPBC Act. See Appendix 1.
- 1080 is a restricted chemical product (under Regulation 45 of the Agricultural and Veterinary Chemicals Code Regulations 1995) and is listed as a Schedule 7 – Dangerous Poison under the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP). These listings require special precautions in the manufacture, handling, storage and use of 1080, along with specific regulations regarding labelling or availability.
- Handling of 1080 powder or concentrated solution and preparation of baits must only be performed by authorised persons who have the appropriate training.
- Prepared and manufactured 1080 baits can only be obtained by through authorised government agencies.

### **ANIMAL WELFARE CONSIDERATIONS**

#### **Impact on target animals**

- The toxicity of 1080 is due to the conversion of fluoroacetate to fluorocitrate, which inhibits the tricarboxylic acid cycle – a mechanism necessary for cellular energy production. In general, herbivores experience cardiac failure, whereas carnivores experience central nervous system (CNS) disturbances and convulsions and then die of respiratory failure. Some species, usually omnivores such as pigs, can be equally affected by both CNS and cardiac signs.
- After a rabbit has ingested 1080 there is a latent period ranging from around 30 minutes to 4 hours before clinical signs including lethargy, laboured respiration and increased sensitivity to noise/disturbance are observed. Convulsions start suddenly, often with gasping and squealing, followed by death. Time to death is variable depending upon the amount 1080 absorbed but is usually around 3 to 4 hours after ingestion. The precise nature and extent of suffering after ingestion of 1080 is unknown.
- To minimise the animal welfare implications of leaving dependent young to die a slow death from starvation it is preferable not to undertake baiting programs when rabbits are known to be breeding. This is also the time when young rabbits do not travel far from their burrows and bucks vigorously defend their territorial boundaries, making it less likely that all rabbits will have access to bait. In many areas of Australia there is a peak in breeding from late winter to early summer when pastures have greened up after rain.

#### **Impact on non-target animals**

- 1080 is toxic to a wide range of species including birds, mammals and reptiles; however there are marked differences in sensitivity. Dogs are extremely sensitive, and most other mammalian carnivores are highly sensitive to 1080 poisoning. Herbivores are less sensitive, and birds and reptiles increasingly more tolerant.
- Poisoning of non-target species can occur either directly by eating baits intended for rabbits (primary poisoning) or through the scavenging of tissues from a poisoned animal (secondary poisoning).

## **NATSOP-RAB001 NATIONAL STANDARD OPERATING PROCEDURE: GROUND BAITING OF RABBITS WITH SODIUM FLUOROACETATE (1080)**

- The susceptibility of non-target species to 1080 poisoning is determined by many factors including sensitivity to the poison, body weight, concentration of 1080 in the bait, bait placement, bait type and palatability, timing of baiting and level of exposure to toxic baits.
- To help reduce risks to non-target animals, the following baiting strategies are recommended:
- *Pre-feeding with non-poisoned bait* – allows an assessment of what animals are eating the bait and the quantities of poisoned bait needed for the control program.
- *Bait type* – use of surface coated rather than vacuum impregnated oat baits will reduce exposure of granivorous birds to the toxin. Most of these birds will only eat the kernel and discard the poisoned husk. Carrots should be diced to an optimal size favoured by rabbits (2 to 5 grams). Pieces smaller than this tend to retain and absorb a higher loading of 1080, dry out and leach 1080 more rapidly and are more likely to be eaten by birds.
- *Colouring of baits* – baits that are dyed a specific green or blue colour may be unattractive or less obvious to birds.
- *Use of bait stations* – bait can be placed under mesh canopies or enclosures where it is accessible to rabbits but restricts access by non-target species such as kangaroos and wallabies. If they are properly secured, bait stations allow rabbit control to be undertaken without the need to de-stock paddocks.
- *Placement of baits* – the laying of poisoned bait in a wide swathe (i.e. broadcast or scattered) instead of a concentrated trail, can decrease the consumption of poisoned bait by non-target species and thus their risk of poisoning. However, uneaten broadcast bait is difficult to cover or collect and destroy after a baiting program. Laying the bait as a concentrated trail in a narrow pre-cut furrow allows subsequent identification of the trail of pre-feed and poisoned bait, attraction of rabbits to the trail and ease of covering up any uneaten poison bait after the program. The bait should always be placed in the prime feeding areas of rabbits.
- *Timing of baiting* – rabbits mostly feed at night, therefore bait laid in the evening will be mostly consumed overnight before diurnal non-target species such as birds will have access. However, nocturnal mammals will be at risk when bait is laid in the evening.
- *Collection of uneaten bait and rabbit carcasses* – any uneaten sections of bait trail should be covered or collected then destroyed or buried.
- *Collection of rabbit carcasses* – where possible, and especially in areas of risk to domestic dogs, carcasses of poisoned rabbits should be collected and destroyed and buried.

### **First aid for dogs**

- Care must be taken to ensure that working dogs and pets do not come into contact with 1080. Dogs may eat poisoned bait (especially pellets) or poisoned rabbit carcasses. The prognosis for poisoned dogs is extremely poor unless vomiting can be induced shortly after ingestion of 1080 and before clinical signs are evident.
- If a working dog or pet is known to have eaten bait or a potentially poisoned carcass, but is NOT yet showing signs of poisoning, induce vomiting by giving one of the following emetics by mouth:
  - washing soda crystals (sodium carbonate) – 3 to 5 crystals
  - table salt – 1 to 3 tablespoons
  - dilute hydrogen peroxide (3% solution) – 3 to 5ml
  - dilute mustard and water solution.

THEN SEEK VETERINARY ATTENTION IMMEDIATELY. The sooner action is taken following poisoning the better the prognosis.

## **NATSOP-RAB001 NATIONAL STANDARD OPERATING PROCEDURE: GROUND BAITING OF RABBITS WITH SODIUM FLUOROACETATE (1080)**

If these emetics are not immediately to hand or you are not having success in making the dog vomit it is better to seek veterinary attention immediately rather than waste time.

- If the dog has already begun to show signs of toxicosis (retching and vomiting, frenzied behaviour such as running and howling, convulsions, difficulty breathing etc.), DO NOT induce vomiting, but seek veterinary attention without delay.
- Veterinary intervention aims to decrease 1080 absorption and facilitate excretion; control seizures; and support respiration and cardiac function.

### **HEALTH AND SAFETY CONSIDERATIONS**

- Operators using 1080 must strictly follow the directions on the approved label when preparing for use, using, storing, transporting or disposing of the pesticide.
- 1080 is highly toxic to humans and should be handled with care. Store prepared bait and 1080 concentrate in a labelled container in a locked cabinet away from children, animals and food. Do not handle 1080 where there is a risk of contaminating drinking water or foodstuff/feed intended for human or animal consumption.
- Appropriate personal protective equipment, including cotton overalls, washable hat, elbow-length PVC or nitrile gloves and a face mask or safety glasses, should be worn when preparing and handling 1080 baits.
- If 1080 gets on skin, immediately wash area with soap and water.
- After use and before eating, drinking or smoking, wash hands, arms and face with soap and water. Wash contaminated clothing and gloves.
- If poisoning occurs, contact a doctor or the Poisons Information Centre (Ph 13 11 26) IMMEDIATELY. Urgent hospital treatment is likely to be needed. There is no effective antidote to 1080.
- For further information refer to the Material Safety Data Sheet (MSDS), available from the supplier.

### **EQUIPMENT REQUIRED**

#### **Bait types**

- Carrot baits are readily accepted by rabbits but tend to dehydrate quickly in hotter climates. They must be freshly prepared and used immediately to prevent deterioration. Carrots must be of good quality and chopped to a standard size (cubes of about 2cm x 2cm). Sieving should be used to remove smaller pieces, ensuring a consistent bait size. Carrots can be used in trails or broadcast.
- Oats and pellets are less susceptible to drying, and are more readily available, cheaper and easier to store and distribute. When using conventional baiting, oats and pellets should only be used in bait trails, NOT broadcast.

#### **Poisoned baits**

- Preparation of 1080 poisoned rabbit baits must only be performed by trained and authorised officers or, in some States, persons under their direct supervision. Specific instructions on bait

## **NATSOP-RAB001 NATIONAL STANDARD OPERATING PROCEDURE: GROUND BAITING OF RABBITS WITH SODIUM FLUOROACETATE (1080)**

preparation can be found on the approved labels and in various State guidelines e.g. vertebrate pesticide control manuals, Landcare Notes, Farmnotes etc.

- In most States, poisoned baits are prepared by the application of 1080 concentrate to oats, chopped carrots or manufactured pellets in simple mixing equipment. This creates a surface coating of the poison. Other material such as coloured dyes, sugar and starch may also be added. In Western Australia and the Northern Territory, vacuum impregnation is used to force air out of the grains allowing maximum absorption of 1080 into the kernel as well as the husk (one-shot oats).
- The final concentration of 1080 in bait varies depending on bait type:
- Carrot – 140 to 200mg/kg
- Oats and pellets – 400mg/kg
- One-shot oats – 500mg/kg

### **Other equipment**

- personal protective equipment (including overalls, gloves, boots, face shield etc.)
- towel, soap, dish or bucket
- first Aid kit
- warning signs
- marking tape
- leak proof containers for storing poison bait
- specially designed baitlayer
- hoe, disc or mattock for digging shallow furrows
- carrot cutter (if required)
- bait mixer

### **PROCEDURES**

Always read relevant permit for conditions and directions for use.

### **Notification and warning signs**

- All adjoining landholders must be notified of a baiting program. A summary of neighbour notification requirements for each State and Territory can be found in *Appendix 2*.
- Landholders and neighbours must be advised of the risks to humans and non-target animals associated with 1080 use. Stock must be moved from areas where they may have access to bait and domestic dogs should be muzzled or restrained for at least the length of the program. Pet cats may also be at risk of poisoning and should be kept under control.
- Warning signs must be erected at all entry points before laying baits. Each sign will include the date laid, which toxin has been used, and for which pest animal, and also contact numbers for further queries. It is recommended that signs remain up for a minimum of 4 weeks from the last day of baiting. A summary of warning sign requirements for each State and Territory can be found in *Appendix 2*.

## NATSOP-RAB001 NATIONAL STANDARD OPERATING PROCEDURE: GROUND BAITING OF RABBITS WITH SODIUM FLUOROACETATE (1080)

### Distance restrictions

- The specified minimum distances that 1080 bait can be laid from habitation, watercourses, boundary fences and roads etc. must be observed. A summary of distance restrictions for each State and Territory can be found in *Appendix 2*.

### Assessment of site and estimation of rabbit numbers

- To reduce the risks of 1080 exposure to humans and non-target animals, and to maximise effect on rabbit populations, a careful on-site risk assessment should be undertaken before a baiting program is commenced.
- Warrens, rabbit harbour and scratching and feeding areas should be located to ensure accurate placement of bait.
- The density of rabbits on the site should be estimated using spotlight counts and warren monitoring. The location and numbers of rabbits on neighbouring properties should also be approximated.
- Contact your local vertebrate pest control authority for more information and advice on site assessment and monitoring of rabbit numbers.

### Laying of bait

#### Conventional baiting

- Most States use a '*conventional*' baiting technique' where 3 free feeds of non-poisoned baits are laid at intervals of 2 to 3 days. Then 3 to 5 days after the last free-feed, one application of 1080 poisoned bait is laid. Free feeding of non-poisoned bait is an essential step to allow rabbits to become accustomed to eating bait material. It also enables an estimation of amount of poisoned bait required and assessment of any non-target risk. In some cases more than 3 free feeds are needed. Suggested quantities of bait for the first free-feeding are:

Density of rabbits	Trailing		Hand Broadcasting	Mechanical Broadcasting
	Carrots and oats (kg/km)	Pellets (kg/km)	Carrots (kg/ha)	Carrots (kg/ha)

## NATSOP-RAB001 NATIONAL STANDARD OPERATING PROCEDURE: GROUND BAITING OF RABBITS WITH SODIUM FLUOROACETATE (1080)

Low	4 to 5	1 to 2	4 to 8	N/A
Medium	5 to 8	2 to 3	8 to 10	4
High	>8	>3	10 to 15	6

- The amount of bait in the second free feed should be adjusted according to how much bait is taken in the first free feed i.e. increase the amount if most of the bait was taken or decrease the amount if uneaten bait remained
- 1080 poisoned bait is laid at the following intervals after the last free feed:
  - *Trailing* (carrots and oats) – 2 or more days
  - *Trailing* (pellets) – 4 or more days
  - *Broadcasting* (carrots) – 3 to 5 days
- The amount of poisoned bait required is usually around 30% less than the heaviest free feed consumed. This is because rabbits quickly become affected from the poison and the consumption of food decreases.

### One-shot baiting

- Western Australia and the Northern Territory also use a '**one-shot**' baiting technique' where 1080 impregnated oats, proportionally mixed with untreated oats (typically one poisoned grain in 100), are laid at a specified rate. Bait is topped up as required using the minimum amount of bait possible.
- Separate free feeding is not offered.
- An extended period of at least 10 days without rainfall or heavy dew is required for maximum effectiveness.
- The recommend rate of lay for **one-shot** baiting is: 6 kg/km for furrow or ribbon trails (2-3 trails approx. 20 metres apart) and 10-12 kg/km for broadcast or scatter trails.

### Bait placement

- It is preferable to lay baits in the evening as rabbits are active between dusk and dawn.
- The placement of bait is critical. Bait must be laid through feeding areas where rabbit activity is highest and preferably where the pasture is short or absent. It is recommended that two trails are laid. One at a minimum of 30 metres from where rabbits are living, and another 40 metres out from the first trail. Use approximately 16km of trail for each 100ha. Bait is distributed using either of the following methods:



## **NATSOP-RAB001 NATIONAL STANDARD OPERATING PROCEDURE: GROUND BAITING OF RABBITS WITH SODIUM FLUOROACETATE (1080)**

- *Trail (or furrow) baiting* – bait is placed in a furrow 10cm wide and 2cm deep that has been cut into the soil using a hoe, mattock, disc or specially designed baitlayer. *In NSW oats can only be used in trails.*
- *Ribbon baiting* – a narrow band of bait (around 10cm wide) is laid on the natural surface of the soil. This method can be used when a furrow could cause erosion or cannot be physically cut e.g.. in loose sandy soil.
- *Broadcast (or scatter) baiting* – bait is scattered in a swathe around 5 metres wide by hand or using a vehicle-mounted or towed spreader. This method is used in areas where it is impossible to run a trail eg. rocky terrain, near fallen timber, in crops, where erosion may be a problem. A strip of spring steel can be attached to the bait laying vehicle so that a scratch mark is left in the soil enabling the scatter bait trail to be found later.

### **Collection of uneaten bait and rabbit carcasses**

- All poisoned bait that is uneaten 4 days after the baits were laid should be collected and destroyed either by incineration or burying at a depth of 500mm. Alternatively, bait can be covered with sufficient soil (at least 10cm) to prevent non-target species from gaining access.
- When broadcasting on a large scale, it is difficult to collect or cover poisoned baits. Therefore the area cannot be restocked until sufficient rain has fallen to render the baits safe ie. around 100mm of steady rain for carrots and 50mm for oats and pellets. The longer the period before re-stocking the less the hazard, especially if a good growth of pasture results from the rain.
- Where feasible, carcasses of poisoned rabbits should be collected daily for a minimum of 14 days after the last poison feed. They should be destroyed by incineration or buried at a minimum depth of 500mm in a disposal pit. The disposal pit must be clear of waterways (permanent or ephemeral). In many situations it will be impossible to locate and destroy all rabbit carcasses. Since toxic concentrations of 1080 can remain in carcasses for >75 days, poisoned areas must be considered dangerous, especially for dogs, for many weeks.

### **PROCEDURAL NOTES**

Users of 1080 must always refer to the relevant federal, state and territory legislation for more detailed and up-to-date information on conditions of use including distance restrictions, public notification and bait preparation, distribution, storage, transportation and disposal.

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## **NATSOP-RAB001 NATIONAL STANDARD OPERATING PROCEDURE: GROUND BAITING OF RABBITS WITH SODIUM FLUOROACETATE (1080)**

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### **APPENDICES**

Relevant federal, state and territory legislation for the use of 1080

#### **Federal**

*Environment Protection and Biodiversity Conservation Act 1999*

Information available from the Department of Sustainability, Environment, Water, Population and Communities website: <http://www.environment.gov.au/epbc/>

#### **Australian Capital Territory**

*Environment Protection Act 1997*

## NATSOP-RAB001 NATIONAL STANDARD OPERATING PROCEDURE: GROUND BAITING OF RABBITS WITH SODIUM FLUOROACETATE (1080)

### **New South Wales**

*Pesticides Act 1999*

### **Northern Territory**

*Poison and Dangerous Drugs Act 1999*

*Territory Parks and Wildlife Conservation Act 1998*

### **Queensland**

*Health (Drugs and Poisons) Regulations 1996*

### **South Australia**

*Controlled Substances Act 1984*

*Controlled Substances (Poison) Regulations 1996*

### **Tasmania**

*Poisons Act 1971*

*Agricultural and Veterinary Chemicals (Control of Use) Act 1995*

### **Victoria**

*Agricultural and Veterinary Chemical (Control of Use) Act 1992*

### **Western Australia**

*Poisons Act 1964*

*Poisons Regulations 1965*

**Requirements for distance restrictions, neighbour notification and warning signs when using 1080 Baits for rabbits**

State	Specified Minimum Distances	Neighbour Notification	Warning Signs
NSW and ACT	Property/Boundary fence 5 m  Habitation 500 m	72 hours (3 days) prior to baiting  Baiting must begin within 7 days of notification and	All entry points, at the extremities of the

## NATSOP-RAB001 NATIONAL STANDARD OPERATING PROCEDURE: GROUND BAITING OF RABBITS WITH SODIUM FLUOROACETATE (1080)

State	Specified Minimum Distances	Neighbour Notification	Warning Signs
QLD	Domestic water supply 100 m	must be completed within 14 days of notification. Further notification is required if 1080 baits are used beyond this 14 day period.	property and at 1 km intervals on a boundary fence fronting a public road
	Waterline of large water storage facilities 10m		
	Property/Boundary fence 5 m	72 hours (3 days) prior to baiting	From start of baiting for minimum of 4 weeks
	Habitation 2 km		
	Declared road 50 m		Kept for a minimum of 1 month
	Town area 5 km		after baiting

## NATSOP-RAB001 NATIONAL STANDARD OPERATING PROCEDURE: GROUND BAITING OF RABBITS WITH SODIUM FLUOROACETATE (1080)

State	Specified Minimum Distances			Neighbour Notification	Warning Signs
NT	No baits are to be laid within 1km of a place of human habitation, public space or public road.			Landholders must inform every person whose property boundaries fall within 1km of the bait sites	Signs must be laid in conspicuous places and on all public roads on the property.
VIC		Trail baiting (m)	Aerial and ground broadcast baiting (m)	24 hours prior to baiting	All entry points  For duration of baiting
	Property/boundary fence	5	50		
	Habitation	150	200		
	Domestic drinking water	20	100		

## NATSOP-RAB001 NATIONAL STANDARD OPERATING PROCEDURE: GROUND BAITING OF RABBITS WITH SODIUM FLUOROACETATE (1080)

State	Specified Minimum Distances			Neighbour Notification	Warning Signs
SA	Watercourse/permanent water	2	50	No notification required	<p>All vehicle entry points and any other commonly used entry points.</p> <p>Must be displayed for not more than 21 days before baits are laid and for at least 14 days after.</p>
	Baits cannot be placed outside the boundary of the landholders property or within 500m of habitation (other than own dwelling)				
TAS	Property boundary 5m Habitation 200m			4 working days prior to baiting	Signs must be laid on gates and

## NATSOP-RAB001 NATIONAL STANDARD OPERATING PROCEDURE: GROUND BAITING OF RABBITS WITH SODIUM FLUOROACETATE (1080)

State	Specified Minimum Distances	Neighbour Notification	Warning Signs
WA	Formed road 5m	72 hours (3 days) prior to baiting	other conspicuous places on the property. Display for a minimum of 28 days
	Permanent running water 20m		
	Property boundaries 20 m		
	Habitation 100m		
	Roads/stock routes/reserves/recreational path 20 m		
	Dams/watercourse 20 m		
	Recreational path or trail 20m		
	Constructed picnic/recreational sites 500 m		All entrances to the property where the baits are laid, and at other strategic points in the vicinity of the baits, for the duration of baiting and for one month after.

## **NATSOP-RAB001 NATIONAL STANDARD OPERATING PROCEDURE: GROUND BAITING OF RABBITS WITH SODIUM FLUOROACETATE (1080)**

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