



NSWFOX SOP7

Baiting of foxes with para aminopropiophenone (PAPP)

Background

Poisoning with para-aminopropiophenone (commonly known as PAPP) is used to minimise the impacts of the introduced European red fox (*Vulpes vulpes*) on native fauna and agricultural production. Lethal baiting is considered to be the most cost-effective method currently available, and foxes are amongst the most sensitive species to the effects of PAPP.

Commercially manufactured FOXECUTE® baits contain 400mg of PAPP in a 35g bait that is sufficient toxin to kill a fox. They also contain small *yellow/orange* marker beads that remain in the gut of poisoned animals which assists with differentiating death due to PAPP from other causes. In contrast, commercially prepared 1080 baits for foxes contain *red* marker beads. Baits containing PAPP are applied by hand directly to the ground and must be buried in a shallow hole. They are not approved for aerial application.

This standard operating procedure (SOP) is a guide only; it does not replace or override the relevant legislation that applies in NSW. The SOP should only be used subject to the applicable legal requirements (including WHS) operating in the relevant jurisdiction.

Individual SOPs should be read in conjunction with the overarching Code of Practice for that species to help ensure that the most appropriate control techniques are selected and that they are deployed in a strategic way, usually in combination with other control techniques, to achieve rapid and sustained reduction of pest animal populations and impacts.

Application

- Subject to an authorised control officer (ACO) risk assessment.
- Baiting with PAPP is best used in a strategic manner as part of a co-ordinated program designed to achieve sustained effective control.
- Baiting with PAPP should not be used in areas where there is an unacceptably high risk to humans and companion animals, such as urban/residential landscapes.
- Baiting with PAPP should not be used in areas where there is a high risk of harm to wildlife. FOXECUTE® PAPP baits are toxic to some native species (i.e., marsupial carnivores, bandicoots, goannas and some birds including ducks) therefore measures must be taken to minimise the risk of non-target poisoning (for example, only baiting in winter months when goannas are least active i.e. where mean maximum temperatures are expected to be $\leq 16^{\circ}\text{C}$).

- Timing of baiting programs on agricultural lands depends on farm management practices and will often occur at or before lambing/kidding. Baiting is also carried out at times when juvenile foxes are dispersing. In contrast, with most programs targeting the conservation of native fauna, PAPP baiting may be continuous and ongoing.
- Baiting of foxes with PAPP 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*). PAPP must also be used in accordance with the Pesticide Control (PAPP) Order (PCO) under the *Pesticides Act 1999*.
- PAPP 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 PAPP, along with specific regulations regarding labelling or availability.
- Manufactured PAPP baits can only be obtained through an authorised control officer.
- The PAPP user should refer to the [NSW Vertebrate Pesticide Manual](#) for all relevant legislation and its application.

Animal welfare considerations

Target animals

- The toxicity of PAPP is due to the formation of high levels of methaemoglobin caused by the oxidation of haemoglobin in red blood cells. When the concentration of methaemoglobin is high, the oxygen carrying capacity of the blood is markedly reduced that leads to a lethal deficit of oxygen (termed *hypoxia* when oxygen levels are low or *anoxia* when oxygen is depleted) in the brain and heart, and results in lethargy followed by unconsciousness and death. Mammalian carnivores are highly susceptible to PAPP compared with other species such as birds.
- After a fox has ingested PAPP there is a lag period before signs of toxicosis such as lethargy, ataxia (difficulty maintaining balance) and salivation are observed. As methaemoglobin levels increase, cyanosis—blue colouration of the mucous membranes due to deoxygenated haemoglobin in blood vessels near the skin surface—becomes evident. Although, the duration of the lag phase, duration and severity of symptoms and time to death can be variable, in a pen study of 10 foxes, the average lag period lasted for approximately 40 minutes, clinical signs were present for around an hour and average time to death was around 1½ hours. As the toxicosis progresses, foxes become unresponsive and cannot move voluntarily, but as observed in wild dogs and feral cats, they are still likely to show signs of awareness and only become unconscious a few minutes prior to death.
- To minimise the animal welfare implications of orphaning dependent cubs, where possible, it is preferable not to undertake baiting programs when vixens are lactating. This is also the time when vixens are moving around least within their territory thus reducing the likelihood of finding baits. To maximise the effect of fox control prior to

spring lambing for example, baiting should be conducted during June and July when foxes are mating and more mobile.

Non-target animals

- Poisoning of non-target species can occur when other animals eat baits intended for wild dogs or foxes (primary poisoning). In addition to wild dogs, PAPP is highly toxic to domestic dogs and cats and may also pose a risk to several native species including varanid lizards (goannas), marsupial carnivores (spotted tail quolls, Tasmanian devils), bandicoots and also some bird species, including ducks.
- The risk of secondary poisoning (i.e., poisoning that occurs through the scavenging of tissues or entrails from a poisoned animal) from PAPP is thought to be relatively low because of the rapid degradation of the toxin, and the low concentration of PAPP in tissues of the poisoned animal. However, it is possible that species such as goannas, that are susceptible to primary poisoning, may also be susceptible to secondary poisoning if they scavenge from the stomachs of fresh carcasses.
- At the conclusion of the baiting program, collect and destroy any remaining baits by burial with a minimum of 500 mm of soil.
- Any fox (or dog) carcasses found after poisoning should be destroyed by burial with a minimum of 500 mm of soil.
- In agricultural areas where the risk to non-target species is unknown, especially where sensitive native carnivores are likely to be present, bait stations using buried, non-poisonous baits should be established and monitored. If baits are taken or disturbed by non-target animals then poison baiting should not be commenced in the area. In conservation areas where native carnivores are known to be present, operators should consult LLS when planning a baiting program.
- Camera traps – devices that detect heat-in-motion – can be used to assess visitation. The camera is triggered to take photos as the subject moves within the detection zone i.e. vicinity of bait station.
- To minimise caching by foxes, bait stations should only contain a single bait. Each bait contains a precise amount of PAPP (400 mg), which is sufficient to deliver a lethal dose to a fox. The rate is calculated to minimise sub-lethal doses and overdosing.
- To minimise the potential for toxic baits to be lethal to non-target animals, the following baiting strategies are followed:
 - *Burial placement of baits* – baits should be buried in a shallow hole and covered with soil or organic material so they are less likely to be removed by native species, particularly birds.
 - *Distance between bait stations* – baits must be spaced with no more than 4 baits per kilometre of trail or 20 baits per 100 hectares to minimise the risk of native animals finding multiple baits. Also, foxes may be less likely to cache baits when they are placed a distance apart.
 - *Marking of bait stations* – mark or record the location of buried baits so that any baits remaining at the end of the program can be collected and destroyed.

- *Timing of baiting* – this should be adjusted to reduce exposure to potentially susceptible species. For example, baiting in winter months, when goannas are less active, is preferred in areas of high goanna abundance.

First aid for dogs

- Fox baits are highly attractive to other carnivores. Care must be taken to ensure that working dogs and domestic dogs and cats do not come into contact with fox baits.
- The PAPP dose in a single FOXECUTE[®] bait is sufficient to kill a 5-7kg fox and this will be lethal for smaller dogs but may not be sufficient to kill a large dog. However, normal protective measures (e.g., secure confinement, restraint and the use of muzzles where appropriate) are required for all domestic dogs in the vicinity regardless of size.
- The prognosis for poisoned dogs or cats is extremely poor unless an antidote (methylene blue) is promptly (preferably no more than 30 minutes after ingestion) administered by a veterinarian. You will need to act immediately to save a poisoned working dog, pet dog or pet cat – take your dog or cat to a vet straight way. Avoid extremes of temperature and keep your dog or cat as calm and quiet as possible.
- If the dog (do not attempt this with an affected cat) is still able to stand it may be possible to induce vomiting – to get the bait out – by giving it an emetic by mouth e.g., salty water (2 teaspoons of salt in a cup of water) or 3 to 5 ‘washing soda’ (sodium carbonate) crystals (DO NOT use ordinary laundry detergent or powder). However, if the dog cannot stand then do not attempt to induce vomiting but take it straight to the vet.
- Veterinary intervention aims to reduce methaemoglobin back to haemoglobin (usually with methylene blue, although this too can be toxic in high doses), provide oxygen and respiratory support and to absorb toxin (with activated charcoal) and promote its excretion (with saline or sorbitol). For further information, vets should refer to [Blue Healer Glovebox Antidote](#).

Workplace health and safety considerations

- Operators using PAPP baits must strictly follow the directions on the approved label when using, storing, transporting or disposing of the baits.
- PAPP baits can be harmful to humans if swallowed. Ingesting multiple baits may cause methaemoglobinaemia leading to anoxia, although the lethal dose of PAPP (or levels of methaemoglobin) causing fatality for humans has not been positively established.
- Store bait in the original labelled container in a locked cabinet or room away from children, animals and food. Do not handle bait where there is a risk of contaminating drinking water or foodstuff/feed intended for human or animal consumption.
- Appropriate personal protective equipment, including trousers and long-sleeved shirts or overalls and chemical resistant gloves should be worn when handling PAPP baits.
- After use and before eating, drinking or smoking, wash hands, arms and face with soap and water. Wash contaminated clothing and gloves.
- If PAPP baits are swallowed, contact a doctor or the Poisons Information Centre (Ph 13 11 26).

- For further information refer to the [Material Safety Data Sheet \(MSDS\)](#), provided by the manufacturer.

Equipment required

Poisoned baits

Always refer to specific permit and approved label for further details. Baits must be laid according to requirements specified under the Pesticide Control (PAPP) Order.

- FOXECUTE[®] baits must only be possessed and used by an authorised control officer or person authorised under the conditions set out in the Pesticide Control (PAPP) Order.
- A single bait contains sufficient toxin to be lethal to a target fox. FOXECUTE[®] baits contain 400 mg of PAPP in a 35 g bait.
- Baits must be stored and transported in a secure and safe manner. It is best to obtain baits only when they are required.
- Baits must be kept, stored or transported in a container bearing the original label, as supplied by the manufacturer. They must be stored in the closed, original container in a dry, cool, well-ventilated and secure area out of direct sunlight and away from children, pets and foodstuffs.

Other equipment

- personal protective equipment
- towel, soap, dish or bucket
- first aid kit
- warning signs
- marking tape and/or pegs
- shovel or mattock for digging holes
- monitoring camera (optional).

Procedures

- An ACO must conduct a risk assessment to determine if it is appropriate to supply PAPP baits to any person. Risk assessments should consider threats to non-target species particularly domestic dogs, human health and the environment.
- ACOs must conduct a risk assessment of planned group baiting programs where baiting occurs less than the prescribed minimum distances provided in the current PAPP PCO.
- Users of PAPP must always refer to any risk assessment and to specific permit, approved label, [Pesticide Control \(PAPP Bait Products\) Order \(PCO\)](#) and the [NSW DPI Vertebrate Pesticide Manual](#) for 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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