



# DOOGABAIT

**PAPP**

Wild dog bait

*An additional tool  
for wild dog control*



acta



awi Australian Wool  
Innovation Limited



Invasive Animals CRC

## Acknowledgements

**Baits containing Para-aminopropiophenone (PAPP) provide a new option for control of foxes and wild dogs.**

The PAPP project has been a large team effort over many years. The end result is a thoroughly tested and well understood bait for canid pest management.

While the team at ACTA and the IA-CRC have anchored the task for over a decade, the project could not have been achieved without the initial financial support of AWI. Critical also were the selfless inputs of many pest managers and research staff in local state and federal agencies, who assisted with field testing. Inputs were also received under contract, from analytical groups, with regulatory and environmental consultants who all helped generate data and documentation. Many private and government landowners allowed the prototype products to be tested on their land.

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**DOGABAIT Wild Dog Bait - 2**

# Wild dog problems in Australia

Wild dogs in Australia are an evolving and complex problem. Initially wild dogs were considered to be dingoes but in recent decades there has been increased interbreeding of dingoes with a wide range of lost hunting dogs and with escaped or dumped domestic dog breeds.

Dingoes came to Australia, probably from Java, some 4000 years ago and whether they are considered native or not, cross breeding between wild dogs and dingoes has put the pure dingo breed under threat.



## WILD DOG DISTRIBUTION IN AUSTRALIA



Adapted from material provided by Peter West (Invasive Animals Cooperative Research Centre), 2011. Prepared from data collected 2006–2010.

Wild dogs can adapt to extreme heat and cold and occur in all habitat types on mainland Australia, including alpine, desert, temperate forests, rainforests, meadows, grasslands, agricultural and urban environments.

Wild dogs are now found from the northern tip of Australia to southern farming zones.



Wild dogs are formidable predators and have no real threats to their increasing numbers and distribution, apart from control actions by land managers.

Government studies list 79 native species as being threatened by competition and/or predation by wild dogs.

The impacts of wild dogs are so great that industry and governments have developed a National Wild Dog Action Plan to achieve a 'best practice' approach to effective management of wild dogs.

The Invasive Animals Cooperative Research Centre (IA-CRC) has also established a number of fact sheets on the wild dog problem and on methods to manage these (see [\*links to additional information at the end of this booklet\*](#)).



*Dead sheep from a wild dog attack.  
Photo Greg Mifsud*

Wild dogs are skilled at killing many Australian native animals and farm livestock. Unlike the fox, which tackles prey up to around their own size, wild dogs can work individually, or in packs, to attack much larger animals including calves, adult cattle and adult sheep.

Injuries are horrendous and many animals are left horribly maimed to suffer long and lingering deaths after vicious



*Importantly, individual landholders suffer the financial burden of implementing wild dog management and also the emotional trauma of finding their stock torn apart, despite their best efforts to control the wandering wild dog menace.*

*Photo: Graham Wienert*





Photo Greg Mifsud



wild dog attacks. Worse still, wild dog packs can indulge in killing frenzies where more prey are killed or mauled than is necessary for immediate feed requirements. Whole flocks of sheep have been lost in a single night from frenzied dog attacks.

Wild dog attacks on livestock and pets, lethal or otherwise, also cause emotional distress to landholders.

Estimates of the impacts on the Australian economy from production losses due to livestock predation, disease transmission in livestock, and the costs associated with wild dog control range up to \$60M annually. However, anecdotal industry sources estimate the economic impact to be much greater, perhaps in the hundreds of millions of dollars per annum.

***The Northern Territory Cattlemen's Association stated that "an estimated 60,000 calves and young weaners were killed directly or were maimed and died of wounds and infection after dog attacks during 2011-2012 at a cost of \$80 million".***

Predation also limits livestock enterprise choices, such as the decision to change from sheep to cattle production in wild dog affected areas, so regional communities are affected by declining sheep numbers via lost employment opportunities.



## Wild dogs and disease

Wild dogs also carry many diseases. The Australian Veterinary Emergency Plan notes that wild dogs are susceptible to African horse sickness, anthrax, Aujeszky's disease, equine influenza, Japanese encephalitis, rabies, Rift Valley fever, screwworm fly, surra, and transmissible gastroenteritis.

Rabies is a key exotic disease risk for Australia and wild dogs are ideal maintenance hosts for this virus.

Wild dogs can also act as a reservoir for endemic parasites and diseases that affect livestock, wildlife and domestic pets, including distemper, hepatitis, hydatids, mange, *Neospora caninum*, *parvovirus* and sheep measles.

The dog tapeworm, *Echinococcus granulosus* – the cause of hydatids – has a well-established sylvatic lifecycle between wild dogs and macropod marsupials with other hosts (foxes) and intermediate hosts (pigs, wombats) playing a lesser role.

## Biology of wild dogs in Australia

The wild dog population in Australia comprises two subspecies: Dingoes (*Canis lupus dingo*) and Feral dogs (*Canis lupus familiaris*), as well as hybrids of the two.

Although individual wild dogs can weigh up to 70 kg, most wild dogs weigh less than 20 kg.

Wild dogs live in family groups and mark out territorial boundaries by defecating and urinating scents. Though often only seen as individuals or pairs, wild dogs are usually organised into distinct social groups consisting of a dominant 'alpha' male and female and their offspring





of various ages. These packs maintain and defend territories that have minimal overlap with those of neighbouring packs. The home ranges of individual wild dogs vary between 10 and 300 Km<sup>2</sup> depending on habitat. Packs are usually stable but under certain conditions some will disperse to new ranges.

While wild dogs generally stay in and around the home ranges, recent extensive studies using satellite tracking and data logging GPS collars have revealed that some dogs can undertake long one-way or return journeys that can be up to hundreds of kilometres. These studies have also shown that within a habitat, wild dogs occupy and use all of the geography and not just the ridge lines or creek beds, as has been previous wisdom.

***Control actions must address the entire landscape.***

Most landholders underestimate the true scale of the wild dog populations and it is a mistake to think that there are just a small number of old rogue dogs to be controlled. Wild dogs have no regard for fence lines and title boundaries, so a "nil tenure" approach is essential to effective management.

Wild dogs also pose a threat to humans and have been implicated in vicious attacks on children. This risk is likely to become greater unless wild dog populations are depleted.



# Traditional wild dog control

Traditionally, wild dogs have been controlled using snare or soft jaw traps, by baiting and shooting and by fencing off vast areas of valued grazing country.

Fences are expensive to maintain and wild dogs are now on both sides of the barrier in some regions. Shooting and trapping can be effective locally, but are expensive and may take only a proportion of the population present. Wild dogs are notoriously cryptic and so not always easy to track or sight in thick country.

While all these methods have been increased in recent years, the wild dog problem continues to expand and it is recognised that the use of poison baits must be included as a part of a best practice integrated approach to deplete the wild dog menace.





*Photo: Chris Thomas*



# Background to the PAPP project

Since the middle of last century, Australia has largely relied on one very effective toxin for control of foxes and wild dogs. The toxin used for over 60 years is sodium fluoroacetate, or 1080, as it was the 1080<sup>th</sup> compound tested in a search for new rodenticides.

While found unsuitable as a rodenticide, 1080 was found to be highly toxic to foxes, rabbits and wild dogs and less toxic to native animals. It continues to be a proven effective tool in the battle against these pest animals in Australia. 1080 is used in reliable manufactured baits and in freshly prepared baits, but agricultural industries recognised the need for additional control tools.



*1080 baits remain an important tool in managing wild dogs*

Para-aminopropiophenone (PAPP) was selected as the next chemical to provide the required efficacy, safety and humaneness for a new bait.

PAPP has been developed as an additional tool and not as a replacement to 1080. Both chemicals have strengths and weaknesses that are useful in different pest management situations.

When the toxicity of PAPP was tested in primates, rodents and dogs, the dogs were much more susceptible than most other species. The reason for the higher risk is that dogs (and also foxes and cats) metabolise the compound largely by a different pathway that causes abnormally high concentrations of a metabolite that induces methaemoglobin in blood.

Methaemoglobin is the oxidised  $\text{Fe}^{+++}$  (or ferric) form of normal haemoglobin  $\text{Fe}^{++}$  (or ferrous).

Normal haemoglobin carries oxygen very well, but methaemoglobin does not carry oxygen.



An animal that experiences high levels of methaemoglobin is unable to deliver oxygen to tissues such as the heart, brain and diaphragm, so will quickly become unconscious and die. An animal that suffers only a mild amount of methaemoglobin can experience temporary lethargy, but will recover to normal within hours.

The unusual metabolic pathway in canid animals (dogs and foxes) makes them highly susceptible to PAPP, so studies commenced on the use of PAPP as a new type of poison to target wild canids. It has taken some 10 years and several million dollars of industry funding from AWI with additional support from ACTA and the IA-CRC to establish, develop and test the new PAPP baits. As this chemical had not been used or registered for any other product, regulatory authorities required a very extensive information package in order to fully evaluate the risks and benefits of the new chemical. In early 2016 final product labels were approved to allow PAPP to be used in baits to control the damage that foxes and wild dogs cause across Australia.

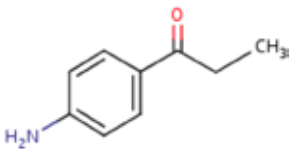
Though PAPP has many benefits that distinguish it from other pesticides, it also carries some risks that need to be understood and managed.

This booklet and supporting documents and advisory notes (see [www.animalcontrol.com.au](http://www.animalcontrol.com.au) & [www.feral.org](http://www.feral.org)) industry publications and Veterinary technical advisory sheets) seek to give all users the correct understanding of PAPP, and the right ways to use PAPP baits to achieve effective wild dog control with minimal risk to users and non-target wildlife.



# What is PAPP?

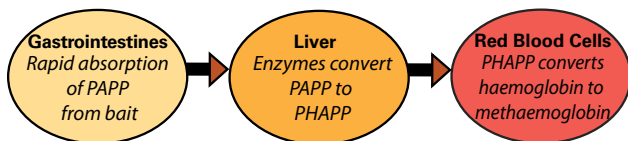
PAPP is the short name given to Para-Amino PropioPhenone.



Though difficult to synthesize, it is a relatively simple molecule. It has no other known use apart from its capacity to induce methaemoglobin.

## Mode of action of PAPP

PAPP is absorbed rapidly from the gastrointestinal tract and is transported to the liver. Foxes and dogs have liver enzymes that convert PAPP to a hydroxylated version, Para hydroxyaminopropiophenone (PHAPP). PHAPP is taken up by red blood cells where it causes the rapid conversion of haemoglobin to methaemoglobin.



If levels of methaemoglobin exceed about 80% the affected animal dies quietly due to loss of oxygen. This is known as metabolic anoxaemia and is totally painless. Metabolically, the effects can be likened to carboxy haemoglobinaemia that is caused by carbon monoxide poisoning. Thus, PAPP poisoning is amongst the most humane pest control techniques known.

The process of absorption of PAPP, metabolic transformation to PHAPP and then action in the red cell is fast. Peak PAPP levels are reached within about 30 minutes and peak plasma methaemoglobin levels are reached about 20 minutes later.

The action of PAPP is fast, if sufficient quantities of the toxin are given and absorbed quickly. The ACTA baits that are designed to deliver PAPP achieve this rapid delivery once eaten.

An animal exposed to a lethal dose of PAPP will quickly lose consciousness from anoxia without any other clinical signs, other than characteristic grey to bluish discoloration of the tongue and gums due to lack of metabolic oxygen.



Typically a fully dosed pest animal will die within 1.5 hrs of ingesting a bait. This is shorter than the time taken for 1080 to kill, which is approximately 4.5 hrs for a fox that receives 3 mg 1080 fox bait or up to several hours for a wild dog affected by a 6mg 1080 bait. However, during this lag phase there are few clinical signs until the final stages of toxicosis with 1080.

PAPP doses exceeding about 25 mg/kg liveweight will kill most dogs and foxes. However, the difference in average liveweight of foxes (5-7kg) versus dogs (typically 15 to 30 kg) mean that much higher doses of PAPP are needed in wild dog baits than for fox control. Baits are dosed with an overage to ensure high efficacy.



If the toxin is absorbed slowly this will allow time for detoxification mechanisms to work and the animal will not reach the critical levels of methaemoglobin to cause death.

An under-dosed animal will become lethargic for a short time, but can recover quickly without treatment and suffers no long-term effects. Also, all animals possess a protective enzyme called *methaemoglobin reductase* that protects against methaemoglobinaemia. This enzyme is a safety mechanism to convert methaemoglobin back into normal haemoglobin.

Gradual administration of PAPP or low doses of PAPP will cause only a temporary and partial increase in methaemoglobin, but the animal will quickly recover.

Both PAPP and PHAPP are metabolised and excreted quickly, mainly via the kidneys into urine. So if the animal does not die from the acute overdose, recovery is fast. Moreover, there is no bioaccumulation, so repeated small doses would have little or no impact. There are long-term effects from sub-lethal exposure to PAPP.



# Features of the DOGABAIT PAPP wild dog bait.

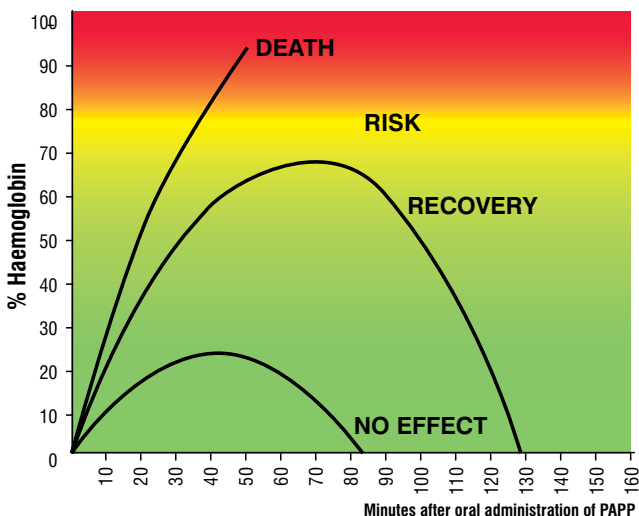
The dose used for the control of wild dogs in DOGABAIT is 1000mg/bait and is a modest overdose for effective knockdown of any dog.

PAPP is highly toxic to dogs and foxes but much less toxic to most other species. However, there are some species that are more susceptible to PAPP than to 1080. 1080 has very low toxicity for goannas but they are vulnerable to the doses of PAPP used in both fox and dog baits. For this reason the label recommends that PAPP baits are not used when goannas are most active and that PAPP baits are also not approved for aerial applications.

Quolls and bandicoots could also be vulnerable to baits containing PAPP, but studies have shown low uptake of baits by these native species. Independent environmental authorities have assessed that even if some individuals are lost during fox control programs, the impact on populations of quolls and bandicoots is low. Removing predators that otherwise prey on native species or compete for their food, is of greater benefit than the risk, so the balance of acceptable risk is in favour of baiting to control predators.

Risks to non-target animals are further reduced by the burying or covering baits, which reduces access to baits by birds and small native mammals, while not greatly impeding uptake by wild dogs.

**% Blood Haemoglobin Levels after PAPP ingestion**



While action of PAPP is fast, death only occurs if sufficient quantities of the toxin are eaten and absorbed quickly. The DOGABAIT bait achieves this rapid delivery. However, if small amounts of bait are eaten slowly, this will allow time for detoxification mechanisms to work and haemoglobin levels will not become elevated sufficiently to cause death.

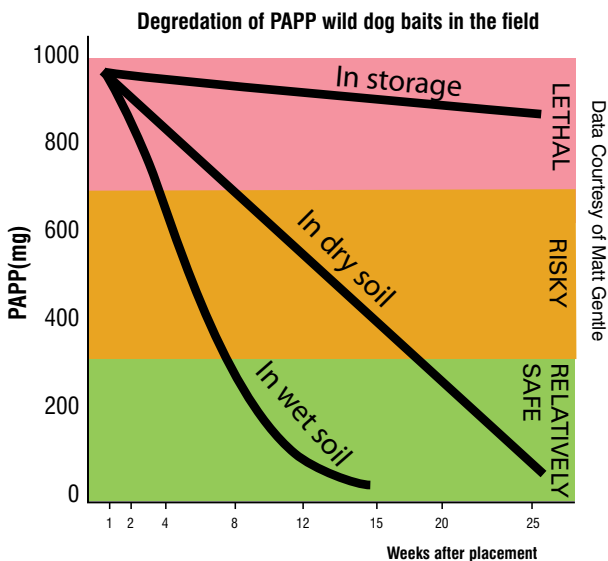
## PAPP degrades in the environment

PAPP, like 1080, also degrades in the environment, though the breakdown rate for PAPP is slower than for 1080 baits. Breakdown depends upon soil temperature and moisture.

Indicative studies have shown degradation rates for DOGABAIT baits under field conditions with lethal doses remaining for up to several weeks from deployment. This is longer than the 1 – 2 week period for 1080 baits to degrade in moist soil.

## No risk of secondary poisoning:

The levels of PAPP residue in a carcass are very low so sufficient tissue could not be eaten quickly enough to lead to secondary poisoning of any scavenging animal.



# Blue Healer Antidote

Any compound that reverses the methaemoglobin back to normal haemoglobin can reverse the effects of PAPP, even if an affected animal is close to death. Response to treatment is immediate.

A common antidote to methaemoglobinaemia is Methylene Blue, when injected intravenously. Sterile methylene blue solution is commercially available as a human medicine and Vets can purchase this product. A ready-to-use product for dog owners is in development but is not yet available.



An advisory package has been provided to all veterinarians and training is to be incorporated into new veterinary teaching programs.

Most large animal vets will already have a stock of methylene blue as it is also used to treat nitrate/nitrite poisoning in cattle.

Emergency treatment regimes prepared by the Australian Veterinary Association include treatment recommendations such as the use of activated charcoal, oxygen supplements and post treatment monitoring.



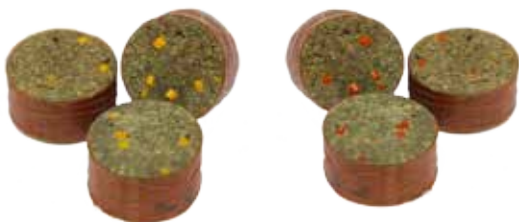
**However, as PAPP acts quickly it is imperative to intervene as quickly as possible in an emergency.**

Typically, it will be necessary to get the affected non-target animal to a vet within 30 minutes of ingesting a bait. This means that it may not be possible to administer the antidote fast enough in remote areas. Fitting of muzzles or movement restraints on working dogs is important if they are near to a baited area.



# Differentiating 1080 and PAPP baits

Another feature incorporated into PAPP baits by ACTA is the inclusion of small plastic marker beads. These remain in the stomach or gut of an animal that is killed and can even be found in a long-decayed carcass.



PAPP baits have  
**yellow/orange beads**

1080 baits have  
**red beads**

The marker beads used in PAPP baits are yellow/orange whereas those to be used in 1080 bait manufactured by ACTA will be red. If a dog is presented to a vet it can be made to vomit and the nature of the poison immediately determined by the colour of the beads.



Moreover, dogs that have become ill for other reasons, such as snake bite (a common cause of death in farm dogs), will have no beads present. This increases the ability of vets to diagnose the best course of treatment and will help overcome some false claims that pets or other wildlife have been killed by baits when there is another cause of death.



## Why PAPP baits are dearer than 1080 baits:

PAPP is synthesised from a precursor chemical called aniline, but its synthesis requires special conditions and releases corrosive by-products that can damage reaction equipment. Therefore, PAPP is more expensive than 1080 to synthesise. Also, high doses of PAPP are required for foxes and dogs (400 or 1000mg PAPP per bait) compared to 3 or 6 mg of 1080 respectively. Additionally the cost of gaining regulatory approval has been high. A royalty from sales will be returned to the IA-CRC and AWI to assist in further research into pest animal management.

## Understanding the wild dog problem as a basis for action

### HOME RANGES:

Wild dogs have scent-marked home ranges where they spend most of their time. These can vary from 10 to 200 Ha but wild dogs are known to make sporadic transient forays of 10 to more than 100 Km outside their normal home ranges.

The figure opposite shows the activity ranges of 3 female wild dogs that were satellite tracked after being fitted with GPS tracking collars in coastal north east NSW.

Each colour is a different dog and each dot represents a GPS fix, which were taken at hourly intervals.

All 3 dogs moved across private and public tenures, in farm, bush and periurban habitats.

Note the transient excursions outside normal home range.

10



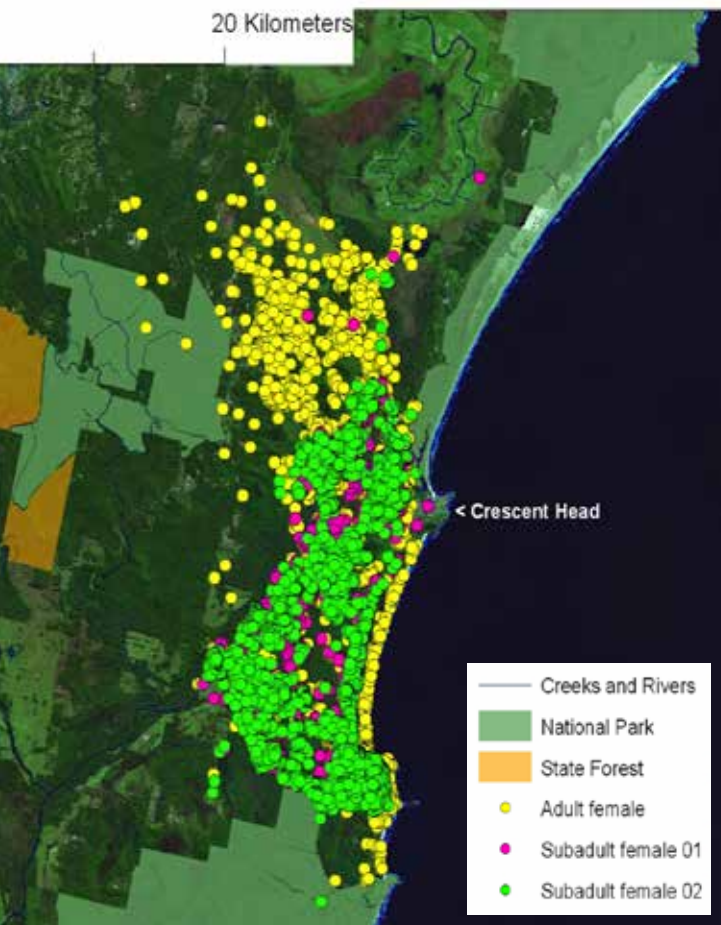
*Map provided by Guy Ballard,  
Vertebrate Pest Research Unit, NSW DPI.*



## WILD DOG BREEDING:

Wild dogs begin the mating period between March and June; pups generally whelp over the period from June to August. Juveniles disperse during the months from September through till March. This can vary with location and seasonal factors. Bitches give birth to 2-9 pups after an 8 to 9 week gestation (a little shorter the larger the dog breed). Pups are nurtured initially by their lactating mothers and then progressively learn to hunt and kill.

The natural death rate of young pups is high. While the maximum age of wild dogs is around 10 years, the average age of wild dog groups is lower.



# Baiting to control

The use of baits is only one tool in a range of options that form an integrated management approach to wild dog control. However, baiting is regarded as the most cost effective method. When conducted carefully baiting programs can effectively reduce populations to manageable levels, then other methods, such as trapping and shooting, can be used to further reduce predator numbers or maintain a wild dog free zone.

**The preceding facts about the wild dog biology give guidance as to the control that needs to be applied.**



Firstly use local knowledge (dog sightings, signs, tracks, stock damage or evidence of stock in distress) to estimate the problem in your area. This includes discussion with neighbours as one pack of dogs may affect many properties.



Work as neighbourly teams and groups, regardless of whether properties graze sheep, goats or cattle. Everyone owns the problem, so everyone should cooperate fully.



In sheep areas wild dogs should be controlled annually or twice annually or in response to fresh attacks, but the greatest focus in cattle areas needs to be around and prior to calving.



Migrating and moving dogs can re occupy small control areas, so co-ordinated programmes with neighbours will provide better long-term outcomes. Large-scale programs work best for depletion and to limit re-infiltration.



# wild dogs



Since wild dogs can move rapidly, it is not wise to place baits too close together, as a single dog can find and take several baits. Wild dogs have taken up to nine lethal 1080 baits, before succumbing to the first, if baits are placed too close together. This is a waste of baits! Do not set up wild dog bait stations closer than 500 m apart and put only one bait at each station.



Sustained action over years is needed. A single program, with any technique, will not remove all dogs.



Prime times to deliver coordinated community baiting programs include autumn in order to limit the breeding and/or in late spring, when juvenile wild dogs and foxes begin moving through the landscape looking for new territories. This helps reduce recruitment and limits population growth.



# Baiting to control



Replacing baits taken at baiting sites where baits have been taken is good practice. Not all dogs will be killed in a single baiting round.



Establish bait stations throughout an area, not just in rings around lambing or calving paddocks. Wild dogs investigate all parts of their range quickly. Clustering of baits leaves areas where dogs have no bait exposure.



Wild dogs do not necessarily take baits immediately after being laid or on their first visit to a bait station. A dog may wait even weeks then take a bait. Therefore do not expect instant results in only a few nights. No bait or toxin is this effective. Good baiting programs run for several weeks.



Placing baits along travel corridors such as ridge lines, water courses, dry creek beds (subject to distance constraints), fire trails, animal pads and vehicle tracks are all suitable locations to lay baits.



Avoid laying baits where they will become waterlogged, as poison may leach out and the baits become rapidly less palatable if wet. Place baits beside animal pads and not in them.



It is helpful to mark bait sites using ribbon, stock tags, paint or marker stake so that baits can be checked and recovered, if not taken at the end of a program.



Wild dog baits can be buried just under the surface, covered with soil or they can be simply placed on the ground, preferably in spots like tussocks or in logs so that non-target animals can't easily find them.



# wild dogs



Foxes are generally better at finding and taking baits than wild dogs. If there are many foxes present, the foxes must be removed for the dogs to have access to the baits. Over time, the number of baits taken by foxes should decline leaving more for the dogs to find. Wild dog dosed baits will kill any fox but fox dosed bait are also available (FOXECUTE®)



Replace baits as they are taken. This will give better control than putting too many baits out at one time. More than one dog may be in any area, so replacing baits over time increases the chance of controlling the group, whereas placing a lot of baits close together will more likely achieve one very dead dog!

## Protection of working dogs:

Dog baits will kill any dog and collars with name tags offer no protection! The best method to protect working dogs is to keep them well away from baits, restricted in pens or on chains if known to wander, and to use muzzles if dogs are to be used in baited areas.

**BEST TO LEAVE WORKING DOGS AT HOME  
WHEN CHECKING OR LAYING BAITS**



# Availability and approvals for use

DOGABAIT PAPP baits for wild dogs have been approved by APVMA. Legal instructions and restrictions for use are found on the approved product labels and must be followed. In addition, some constraints differ between States so local instructions must also be followed.

Approved labels and MSDS sheets are available on the ACTA web site  
([www.animalcontrol.com.au](http://www.animalcontrol.com.au))

Due the imposition of **RESTRICTED S7** status by the National Drugs & Poisons Scheduling Committee (NDPSC), only approved users can access PAPP bait products. Approvals and some constraints may differ between States, so local instructions must also be followed.



**DOGABAIT baits are available in pails of 10 or 50 baits only from traditional suppliers of 1080 baits in all states.**

**FOXECUTE® Baits are available in packs of 10 or 40 baits.**

## Notification:

Immediate neighbours must be notified 72 hours before DOGABAIT PAPP baits are deployed.

## Storage Directions:

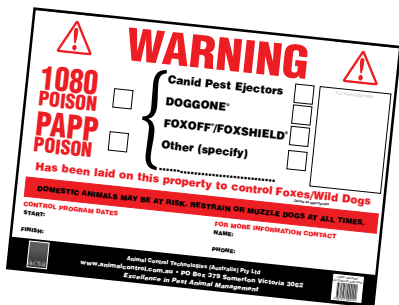
Baits must be kept out of reach of children and stored in a locked area.



## Warning signs:

Signs must be put up at property entrances before the start and remain in place until 4 weeks after the end of approved programs, or until residual baits are recovered.

Reusable warning signs printed in UV resistant ink and on water resistant corflute are available from ACTA.



## Distance restrictions:

There are restrictive requirements for placement of baits. The label restrictions are, that baits must not be placed:

- Within 150m of a dwelling
- Within 20m of a watercourse
- Within 5m from boundaries or roads

## Safeguards for the environment

PAPP is stable in DOGABAIT during storage but degrades in the environment. There are no long-term residues. There is no risk of contamination of the human food chain or crops from the proposed application as a bait for control of wild dogs. PAPP is mixed throughout the bait, so a small animal nibbling at the bait would receive small quantities of toxin only.

## Safeguards for users

PAPP is more toxic to canids than for most other animals, but it is still a poison. Large doses can kill any animal and the bait products are **poisonous if swallowed**. PAPP is not readily absorbed through skin. Contamination is easily removed by washing in soapy water.

## Additional information

Poisons information line 13 11 26

**ACTA web site:**

[www.animalcontrol.com.au](http://www.animalcontrol.com.au)

**Pestsmart tool kit**

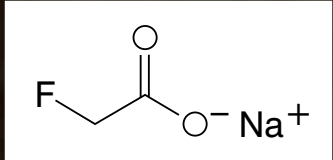
[www.pestsmart.org.au/pestanimal-species/wild-dog/](http://www.pestsmart.org.au/pestanimal-species/wild-dog/)

[www.pestsmart.org.au/pestanimal-species/wild-dog/wild-dogaction-step-1/](http://www.pestsmart.org.au/pestanimal-species/wild-dog/wild-dogaction-step-1/)



# How does PAPP

The mode of action of PAPP (see page 12) is different from the mode of action of 1080. Sodium fluoroacetate (1080) is a naturally occurring plant toxin. It is found in several plants but especially in *Gastrolobium* and some acacia species. It is a simple molecule that is deceptively similar to normal acetate which is an essential intermediate in the break down of sugar into energy.



1080 works by blocking the action of a critical enzyme (*aconitase*), which is one of a series of enzymes responsible for converting sugar into chemical energy in all animal cells. This enzyme sequence occurs in the mitochondria (“energy factories”) of cells and is known as the Tri Carboxylic acid, or TCA cycle. 1080 works as a “spanner” in the gears of the energy factory, so all other biochemical processes that require energy cease, as metabolic energy is depleted.

Enzymes in some species are less able to be blocked by 1080, so reptiles are generally less susceptible than birds and birds are less susceptible than mammals. Even between mammals there are large differences in susceptibility. One reason for this is that 1080 occurs naturally in some toxic plants in Australia, so Australian native herbivores that eat such plants have been naturally selected for resistance.

Thus, 1080 can be used selectively to control wild dogs and foxes (since the introduced pests have not had the evolutionary time to adapt), while posing limited risk to the vast majority of native species.

Photo Chris Thomas courtesy IACRC



# differ from 1080?

Risks are further reduced by using baits that are preferred by the pests but not palatable to the non-target species and by using baiting techniques such as “buried baits”, (where possible) that reduce the risk of non-target animals taking baits.

These practices have been well developed and tested over many decades and enable foxes and wild dogs to be controlled while posing limited risk to non-targets.

However, 1080 is highly toxic not just for foxes and wild dogs but also for pets and working dogs. For this reason many landowners are reluctant to use this effective chemical as widely as is needed to manage the pest wild dogs and foxes.

While the action of 1080 is only to block an enzyme in the mitochondria, the resultant biochemical disruption of sugar metabolism, into carbon dioxide and energy, causes a build-up of citrate in blood. Citrate binds up calcium ions that are necessary for normal muscle function and coordination. Therefore, during the last phases of poisoning with 1080, while the animal is unconscious, an affected animal exhibits muscle spasms that can be distressing for an owner to witness. Moreover, there is no proven antidote to poisoning with 1080 so most dogs that accidentally take a bait will succumb, even despite veterinary intervention.



**ACTA products for large-scale pest animal management  
available through agencies and/or leading rural merchant stores:**



**FOXOFF®**

**Fox Bait**

For the control of foxes



**SLUGGOFF®**

**Slug & Snail Bait**

For the control of snails & slugs in  
the home garden



**FOXSHIELD®**

**Fox Bait**

Fish based bait for fox control



**DEN-CO-FUME®**

**Fumigation Cartridges**

For the control of foxes in natal dens



**DOGGONE®**

**Wild Dog Bait**

For the control of wild dogs



**RABBAIT®**

**1080 Oat Bait**

For the control of rabbits



**RABBAIT®**

**Pindone Oat Bait**

For the control of rabbits



**MOUSEOFF®**

**Zinc Phosphide Bait**

For the control of mice in crops



**MOUSEOFF®**

**Bromadiolone Grain Bait**

For the control of rats and mice



**RATTOFF®**

**Zinc Phosphide Bait Sachets**

Reducing rat populations in  
sugarcane crops



**MOUSEOFF®**

**Bromadiolone Rodent Block**

For the control of mice and rats in domestic,  
commercial & industrial buildings



**PIGOUT®**

**Feral Pig Bait**

For reductions in feral pig  
populations



**FOXECUTE®**

**PAPP Fox Bait**

For the control of foxes



**DOGABAIT**

**PAPP Wild Dog Bait**

For the control of wild dogs



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