

Intensive Pest Animal Management

Choosing the right bait

June 2010

Considerations

There are quite a few alternatives when it comes to choosing a pesticide. Factors that will need to be considered include –

- Target pest
- Presence of pets or livestock
- How regularly pesticide can be checked
- Cost
- Presence of non target valued fauna
- Residual risk in the environment
- Licensing requirements
- Presence of people (especially children)

Risks and terminology

- Strictly speaking, a bait is a lure or attractant used in conjunction with a toxin. We use the terms **pesticide** or **toxin** here for clarification.
- Secondary poisoning - occurs when non-target animals eat sick or dead pests and become affected by the poison. Secondary poisoning can result in death, although for some poisons there are antidotes. Some pest control operations rely on the fact that mustelids and feral cats will die due to secondary poisoning.
- Direct poisoning - occurs when pesticide is consumed by a non-target animal such as a dog. Death is likely unless an antidote is administered in time.
- Sub-lethal dose – an animal eats the pesticide but not an amount sufficient to kill it, although it may become ill. Such animals usually

- become bait shy because they associate eating the bait with feeling unwell.
- Residual risks -
 - bioaccumulation occurs when an animal eats the pesticide but isn't killed by it, and the poison then accumulates in the organs or fatty tissue. Bioaccumulation also occurs when animals eat other animals with poison residue. For example, a kiwi may eat a weta that has recently ingested a poison. Little is known about the long term effects of bioaccumulation but it is generally better to avoid the risk. Bioaccumulation may become a health threat to humans if an animal with poison residue is consumed e.g. feral pigs. Some poisons (e.g. brodifacoum) are biologically persistent, i.e. accumulate in organs or fatty tissue but break down over time.
 - uneaten pesticide remains in the environment and is active (toxic) for a period of time, posing a risk to non-target animals.

Frequency of pesticide checking

This is important when using 1st generation anticoagulants, as pesticide needs to be continuously available for up to 5 consecutive days. Bait stations need to be kept full until all animals have accessed the pesticide.

Pesticide consistency

Cereal formulations are usually more palatable but will deteriorate quickly once outdoors (even when enclosed in a bait station). To increase longevity, we recommend sealing these pesticides inside a plastic bag before placing in the bait station. It is often desirable to use a waxed block formulation to increase field life, and to avoid caching (storing) of pesticide by rodents. A waxed block with a central hole that can be fixed in a bait station is ideal. Recent developments of pastes and long life gels provide more options especially if you don't want to have to service bait stations too often.

Cost

Long life formulations are generally more expensive than pellets, and pest animals may be able to eat quite a lot more than a lethal dose before dying – increasing the cost of baiting. For maximum cost effectiveness where initial pest numbers are high, use an effective fast acting pesticide like cyanide or brodifacoum first for a quick knock down of pests followed by a maintenance programme with waxed or longer life bait.

Licence requirements

Some of the baits listed below are only able to be used or purchased by licensed personnel or authorities. Sometimes the ARC can undertake control using restricted baits for you, or put you in touch with our preferred contractors. Contact your local Biosecurity Officer for more information. We have included all bait options currently available so you can make an informed decision about what best suits your situation.

Pesticides

Pesticide is divided into different types based on method of action –

- Anticoagulants – first and second generation
- Choliciferol
- 1080
- Cyanide

Anticoagulants

These pesticides kill animals by causing internal bleeding.

First generation anticoagulant

- diphacinone (e.g. Ditrac, Ratabate, Pestoff® Ferret paste, Pestgone)
- coumatetralyl (e.g. Racumin®, No Rats & Mice, Tracks No Rats)
- pindone

These toxins were the first developed. Animals must eat the pesticide over a consecutive period of up to 5 days to get a lethal dose. They tend to be slower acting than second generation pesticides, taking 5-8 days to kill the target animal. Overseas, rodents have become resistant to first generation pesticides because of consuming sub-lethal doses or because only one type of toxin has been used over a long period, leading to pesticide resistance.

Diphacinone and coumatetralyl are suitable for targeting rodents, Pindone can also be used for rabbits and possums (ensure you use the correct formulation).

Advantages	Disadvantages
Relatively cheap	Need continuous feeding for up to 5 days
No licence required to use (except for liquid Pindone)	Not usually suitable for possums because of the quantity required to be eaten, although possums will eat it, resulting in less available baits for rodents
Antidote available, but requires long term treatment	Slow to break down in the soil, not water soluble
Low risk of secondary poisoning	

Second generation anticoagulant

- brodifacoum (e.g. Pestoff, Talon)
- bromadiolone (e.g. Ridrat, Contrac, Squeak)
- flocoumafen (e.g. Storm, Stratagem)

These pesticides were developed to overcome the problems with first generation products. They tend to be stronger, faster acting and pests can consume a lethal dose in one sitting.

Suitable for targeting rodents & possums.

Advantages	Disadvantages
Relatively cheap	High risk of secondary poisoning
No licence required to use	Possums can eat more than a lethal dose increasing cost
Antidote available, but requires long term treatment	Slow to break down in the environment

Cholecalciferol (e.g. Feracol® and No Possum gel bait)

An acute poison that works by releasing calcium which leads to cardiac arrest or renal failure. Possums will lose their appetite after 24 hours and die within nine days; rats will die within 4 days.

Currently registered for use on possums and rats.

Advantages	Disadvantages
Effective at rapidly reducing possum population	Expensive (As at June 2010 cholecalciferol is not generally available as the raw ingredient is too expensive for NZ manufacturers to use)
Low risk of secondary poisoning	Antidote treatment available but expensive
Only single dose required	
Doesn't require a licence to use	
No bioaccumulation	
Degrades rapidly in the environment	
Less toxic to birds c.f. 1080	

1080 (Sodium monofluoroacetate)

Causes cardiac or respiratory failure, death occurs within 48 hours for possums.

Widely used for large aerial control operations for possums.

Registered for use on possums, deer, goats, wallabies, rodents, cats and rabbits.

Advantages	Disadvantages
Achieves consistently high kill rate 80-100%	Requires a licence to use and buy
Only single dose needed	Some risk of bait shyness if sub-lethal dose consumed
Low risk of secondary poisoning	No antidote available
Highly soluble in water, breaks down quickly	Livestock require a withholding period
Cheap	
Generally low environmental impacts	
Generally safe for widespread application if best practice implemented	

Cyanide (e.g. Cyanide paste, Feratox, Cyanara ferapaste).

Very effective acute toxin causing respiratory failure within minutes.

Currently registered for use on possums, ferrets and wallabies (dama and Bennetts only).

Advantages	Disadvantages
Cheap	Requires a licence to use and buy
Humane - very quick death	Usually no time to administer antidote
Degrades rapidly in the environment	Very toxic, subject to strict controls for transport, storage and use
Low risk of secondary poisoning	
Only single dose required	

Summary of options available

Bait type	Possums	Rodents	Mustelids & Feral cats	Rabbits
1st generation anti-coagulant	No (unless Pindone)	Yes	Limited secondary kills only except for ferrets (Pestoff® ferret paste)	Pindone only
2nd generation anti-coagulant	Yes	Yes	Secondary kills only	No
Cholecalciferol	Yes	Yes	No	No
1080	Yes	Yes	Secondary kills only	Yes
Cyanide	Yes	No	No	No

Our recommendations

If targeting possums only - use either

- Cyanide (**requires licensed operator**); or
- Brodifacoum; or
- Cholecalciferol; or
- 1080 (**requires licensed operator**)

If targeting rats only – use either

- Diphacinone; or
- Brodifacoum; or
- Cholecalciferol

For rats and possums – use either

- Brodifacoum or
- Cholecalciferol

Why use a bait station?

Using a bait station ensures that –

- Pesticide is kept dry and is effective over a longer period
- Access to non-target animals is restricted or prevented
- Allows the placement of signage
- Makes setting up a permanent bait network easier.

The bait station we recommend is the mini Philproof. This station has a good design and is large enough for most pest animal control operations. We may be able to supply Philproofs to you at cost. Please contact your local Biosecurity Officer for details.



Hey this is mine, get lost!



Surely there's more in here ...