

BACKGROUND

Pelletised cereal bait containing the anticoagulant poison brodifacoum (pronounced "bro-dye-far-koom"), has proven to be a critically important possum control tool since 1992 when it was first registered for use against possums. Brodifacoum baits applied in bait stations have achieved and sustained lower possum densities than have other baits and toxins. Forest habitats have improved dramatically and the Tb infection risk to livestock has been eliminated in many areas where regular pulses of brodifacoum bait have been applied in bait stations.

THE BAIT STATION ADVANTAGE

Bait stations are most commonly used where rural property owners want sustained protection against the ecological damage, disease risk and financial losses which possums cause. The move to "user pays" pest control in most areas means that landowners need a possum control tool which is both effective and affordable.

In general, the operation of bait stations is much less labour intensive and more cost effective than the alternatives such as trapping, cyanide poisoning and night shooting. This is because bait stations, unlike the other methods, offer control over several consecutive nights - therefore increasing the duration of the control effort. The use of anticoagulant bait also presents a relatively low risk to humans, pets and livestock but measures must be taken to ensure that only possums have access to the bait.

BAIT STATION DESIGN

There are many of types bait stations on the market, but few of them actually keep the bait dry in the feeding area. Possums won't eat pellets which have turned to porridge after being rained on!

The best bait stations will stack, minimise bait spillage, are easy to fill, are UV stabilised and provide reliable bait delivery. Select a bait station design which best meets your particular needs. The Philproof bait station is a simple yet extremely effective design.



The "Philproof Mini" bait station shown here is widely available, holds 700 grams of pellet baits and is very weather resistant.

BAIT STATION PLACEMENT

Bait stations should be placed about 100 metres apart on bush/pasture margins and along shelter belts. In bush blocks, use two bait stations per hectare. Mount the bait stations on a prominent tree or fence post with the feed area about 20 centimetres above the ground, or above a branch where a possum can sit comfortably while feeding. Take precautions to ensure that stock can't gain access to the bait stations or to any bait which may be spilled. Some stock, especially horses, will go to all lengths to extract bait from a bait station, often kicking the bait station apart to do so!



PESTOFF: THE BLUE POSSUM BAIT

Pestoff brodifacoum pellet products for use in bait stations are coloured blue to enable operators, land owners and the public to distinguish between brodifacoum baits and other products such as green 1080 baits or naturally fawn-coloured feed pellets.

Pestoff bait combines the proven effectiveness of the anti-coagulant toxin brodifacoum with a highly palatable pellet bait for possums. The bait has good resistance to moisture when used in bait stations and it is ideal for use by farmers involved with "self-help" or "LIPS" schemes. Pestoff possum bait is also available with a wax coating to maintain bait freshness and preserve bait palatability in particularly damp climates.

Both standard and wax coated Pestoff possum bait is used by regional councils, the Department of Conservation, commercial pest control operators and farmers. It is registered for use only in bait stations but can be purchased and used without the need for a licence.

TECHNICAL INFORMATION

Pestoff possum bait contains brodifacoum at a concentration of 20 parts per million (0.002%). Brodifacoum is an anti-coagulant which has a delayed action in killing possums. This ensures possums do not become bait-shy while feeding on the bait over three or four nights. Possums will not suffer any symptoms of poisoning for several days and will die by bleeding internally; usually between ten and twenty days after accumulating a lethal dose of poison.

BAITING STRATEGY

Place approximately 500 grams of pellets in each bait station and maintain the supply of bait for three to five nights. Possums sometimes take one or two nights to locate bait stations and to begin feeding freely. If daily checking of the bait station is not possible, it is best to fill each bait station to capacity, at least for the initial fills. Cease baiting for about three weeks and repeat baiting for three to five nights after 1 month to remove any residual or immigrating possums.

Although the amount of bait eaten by possums on the first night may be small, most possums will soon eat as much as 30 or 40 grams of bait per night. So if possum densities are around 8 per hectare (which is not unusual), 1 kilogram of bait will last only 4 to 5 nights. Bait consumption at a higher rate than this indicates a

very high density of possums but may also indicate high rat densities. Pestoff bait will also kill rats effectively.

If the high bait consumption rate is due to possums only, you may need to consider using an acute toxin such as Pestoff DECAL Possum Bait. The feeding of a very small quantity of DECAL Possum Bait after a short period of feeding Pestoff Brodifacoum Possum Bait is an extremely effective way to reduce possum numbers quickly. Acute toxins such as cyanide, 1080, or phosphorus are also effective for controlling very high or previously uncontrolled possum populations but these toxins may only be applied by operators holding a Controlled Substances License.



The stress of possum browse will weaken and kill even healthy, mature trees - as it did in the case of this rata.

STOCK AND FERAL PIGS

Domestic livestock, pets and poultry must not be allowed to have access to bait stations containing Pestoff bait and do not feed possum carcasses poisoned by the bait to dogs or pets as unacceptable residues are likely to occur in the animal livers.

When using this bait in areas where feral pigs occur, ensure pig hunters using the area are made aware that pigs in the area may be carrying high levels of brodifacoum residues; particularly in their livers. It is a legal requirement that warning signs are erected warning that brodifacoum has been used for possum control in the area. Signs must remain for 9 months after baiting ceases.

BAIT TRANSPORT AND STORAGE

Pestoff bait is not classified hazardous for the purpose of transportation and any volume can be carried by vehicle. As with all cereal based products, there is some risk of the pellets being crushed or broken if care is not taken during transport and storage. Handle the product carefully and avoid dropping bags or stacking other materials on bags. While some pellet dust is unavoidable, this should however be only 1-2% of the total contents of any bag. Store bait in a cool, dry and preferably well aired place out of direct or diffused sunlight. This will maximise its life under storage. Never refrigerate the pellets and take care to avoid cyclic heating and cooling. Sudden temperature changes can cause condensa-

tion on the inner surface of the bags which can cause mould followed by rapid bait decay. Low concentrations of preservative are included within the bait to extend shelf life but it is recommended that the product be used within 3 months of the date of purchase to prevent a decline in its palatability to possums.

SAFETY

Store the pellets out of reach of children and animals, preferably under lock and key. When handling the bait, wear rubber or PVC gloves and do not smoke, drink or eat. Wash hands thoroughly after any contact with the bait. Read the precautionary statement on the product label. A safety data sheet for this product can be downloaded from <http://www.pestoff.co.nz/msd/brodif02prods.pdf>

MORE ABOUT BRODIFACOU

Anti-coagulant poisons were first discovered in the 1920's when farmers in Alberta and North Dakota found their cattle dying of internal haemorrhage 15-50 days after eating sweet clover which had gone bad. The spoiled feed had produced a compound known as dicoumarol which reduced the ability of the blood to clot.

Between 1941 and 1944 dicoumarol was used to treat cardiovascular disease in humans and subsequent efforts to synthesise dicoumarol led to the discovery of "Compound 42" - now known as warfarin. Warfarin became important in treating cardio-vascular diseases but more significantly, in 1948 the Wisconsin Alumni Research Foundation (WARF - hence the name warfarin) began promoting warfarin as an important rodenticide.

The appearance of rats resistant to warfarin stimulated the search for more potent, faster acting rodenticides. The new second generation anti-coagulants which emerged included difenacoum, flo-coumafen, bromadiolone, chlorophacinone and brodifacoum.

A 31 year old woman who attempted suicide by eating 1.5 kilograms of rat bait (the equivalent of about 75 mg of pure brodifacoum) was checked by doctors and found to have no physical signs or symptoms. However her blood clotting time was 72 seconds instead of the normal 12 seconds. Despite vitamin K1 therapy, it took some 45 days for her blood clotting time to return to normal.

This demonstrates the adverse effects that even low doses of brodifacoum may have on human health. A lethal dose for humans is estimated at about 15 mg of pure brodifacoum per kg of body weight. This equates to about 5 kg of bait for a toddler and about 50 kg of bait for a 70 kg man.

Brodifacoum has been incorporated into possum baits sold in New Zealand since 1992. Its use for possum control has increased as a result of more areas being under maintenance control following initial knock-down operations and as more landowners take responsibility for their own possum control.

Possum baits containing brodifacoum are very effective where light to moderate populations of possums occur and where reduction to very low numbers is sought.

Due to the time lag between eating a lethal dose and the onset of poisoning symptoms (usually several days) animals do not usually associate poisoning symptoms with eating baits containing brodifacoum. Therefore brodifacoum bait does not cause learned bait aversion (bait shyness) as faster acting toxins can do. Bait shyness develops when animals to quickly become ill after eating sub-lethal amounts of poison bait, and then recover to avoid eating

baits in subsequent encounters.

Brodifacoum is not soluble in water and binds strongly to soils - making it almost immobile in soils. It will degrade slowly in soils with pH 5.5 to pH8 under aerobic or flooded conditions and it is not taken up by plants.

Brodifacoum is used at very low levels in possum bait. One tonne of bait contains only 20 grams of brodifacoum. Research shows however that brodifacoum may be persistent in animal livers and this poses a danger to other species through both secondary and tertiary poisoning. The half life of brodifacoum in possum livers is about 36 weeks. Take all practicable steps to prevent brodifacoum from entering the food chain.

Although it is much less lethal to dogs than 1080, brodifacoum can kill dogs that either eat bait directly from bait stations or scavenge several possum carcasses containing brodifacoum. Symptoms include laboured breathing, depression, possibly a cough and an accelerated pulse. Small dogs could obtain a lethal dose from as little as a handful of pellets and a large dog from as little as 200 grams. Unlike 1080 poisoning however, brodifacoum poisoning in dogs is treatable using Vitamin K1 available through veterinarians. Brodifacoum is a very useful, if not essential part of the pest control "tool box" but it must be used carefully and responsibly to ensure non-target animals are not exposed to baits and that any potential secondary and tertiary poisoning risks are effectively managed.

SUMMARY OF BEST PRACTICE USING PESTOFF BRODIFACOU POSSUM BAIT

- **Best used for low to medium possum densities.**
- **Use weatherproof bait stations placed 100 metres apart on bush margins or 2 per hectare in forest.**
- **Place bait stations out of reach of pets, stock and feral pigs.**
- **Initially, fill bait stations (700 grams) and top up to 500 grams of bait per station about 1 week later.**
- **After the initial fill and top-up, leave for 4-6 weeks before repeating to eliminate residual animals.**
- **Repeat this whole process 2-3 times per year.**
- **Manage residue risks and retrieve uneaten baits.**
- **Use Pestoff Waxed Possum Bait in very wet areas.**

OTHER POSSUM PRODUCTS AVAILABLE

Pestoff Waxed Possum Bait.

For use when longer lasting baits are needed under very wet conditions.

Pestoff Hi-Strength Possum Bait.

Available for professional pest contractors engaged in vector control or conservation projects.

Pestoff Decal Possum Bait.

A fast acting bait which works very effectively in small quantities. No license required.

These products are also registered pursuant to the ACVM Act 1997, Nos V005136, V006052 and V009500.



BRODIFACOU POSSUM BAIT

**Bait in pellet form.
Effective, affordable
possum control while
you sleep.**

**Registered to and Manufactured by
Animal Control Products Ltd
408 Heads Road Wanganui**

**Distributed to retailers by Bell-Booth Limited
15 Tiki Place Palmerston/North
Free phone 0800 80 90 91**

**Contains 0.02g/kg of brodifacoum in the form of a bait
Registered pursuant to the ACVM Act 1997, No V004991**