Fact sheet.
October 2007

Key facts about Brodifacoum

What type of toxin is it?

Brodifacoum is a second-generation anticoagulant, which is contained in rodent control products available for purchase at most NZ supermarkets and is widely used. It is structurally related to a naturally occurring coumarin (an aromatic substance found in many plants) that causes cattle to haemorrhage if they eat mouldy sweet clover.

Its usefulness in killing rodents was first noted in the 1970s, and it was first registered in New Zealand in the early 1980s. In New Zealand it is used principally to control brushtail possums and rats. It has been used successfully in rodent eradication programmes on New Zealand's offshore islands.

How does it work?

Brodifacoum, like other anticoagulant toxicants, works by increasing (or decreasing) the clotting time of blood, leading to death from haemorrhaging. Brodifacoum is absorbed through the gastrointestinal tract and can also be absorbed through the skin.

What happens in soil and plants?

Baits containing brodifacoum can remain toxic for months, with the rate of decay depending on the amount of rainfall. As baits disintegrate, brodifacoum is absorbed into the soil where it is then slowly degraded over weeks to months by soil bacteria. Soil type, temperature, and the presence of soil micro-organisms capable of degrading brodifacoum will all influence the degradation time. The low solubility of brodifacoum in water means that plant up take is unlikely.

What happens in water?

Brodifacoum has a very low solubility in water, so leaching from soil into water is unlikely to occur. Only the erosion of soil itself would result in brodifacoum reaching water. If soil containing brodifacoum reached a waterway, the brodifacoum is likely to remain bound to organic material and settle out in sediments. Brodifacoum degrades slowly (weeks to months) in natural water and the presence and type of sediment layers in a waterway will affect the degradation of brodifacoum in aquatic environments. When baits were sown directly into streams during pest eradication operations, brodifacoum residues have not been recorded in water.

What happens to brodifacoum in poisoned animals?

Brodifacoum residues have been recorded in both sub-lethally and lethally poisoned animals. Brodifacoum is not readily metabolised and is stored in the liver of sub-lethally exposed animals, where it can remain for many months. However, residues do not appear to persist in arthropods (insects, spiders, crustaceans) beyond a few days. Brodifacoum is perceived to lack insecticidal properties due to the different circulatory physiology of invertebrates.

Effects on native non-target species

Native non-target deaths, and residues, have been reported in a wide range of species after the use of brodifacoum. Populations of four indigenous bird species (fernbirds, pukeko, Stewart Island weka, and western weka) have been severely reduced in some sites where brodifacoum baits were broadcast. The Department’s policy for using second-generation anticoagulants prohibits the use of brodifacoum on public conservation land for possum control or for rat control in areas where pigs are present. Aerial operations require an Assessment of Environmental Effects to weigh up the benefits and risks to species and the environment long term. The benefits of using brodifacoum to eradicate rats from offshore islands are now well documented in terms of species recovery. In most cases, any short term losses of individuals of native species are offset by the longer term benefits of removing the rats.

Fate in the marine

A study in 1996 monitored reef fish populations at Kapiti island during an aerial poisoning operation using brodifacoum. Blue cod and spotties were studied and the

environment

surveys produced no evidence that their densities were affected by the poison application. (Cole and Singleton 1996 DOC70402)

In 2001 a truck crashed into the sea at Kaikoura spilling 18 tonne of Pestoff 20R (20 mg/kg brodifacoum) cereal pellets into the water. Samples of marine invertebrates (mussels and paua) taken from the immediate location retained measurable residues for up to 31 months. This result was probably confounded by the animals being re-exposed to brodifacoum bait particles through wave action. Effects of the spill were only measurable within a 100m2 area surrounding the crash site (Primus et al. 2005).

What does the bait look like?

Brodifacoum baits are cylinder-shaped cereal pellets about 2 cm long and dyed blue- green.

What's the risk to human health?

The risks to human health are very low in a well-planned and controlled poison operation. Brodifacoum is a slight skin irritant and a mild eye irritant and it is classified as non-mutagenic and unlikely to be carcinogenic.

Vitamin K1 is recognised as an effective treatment, however it has to be maintained for a relatively long treatment period.

What about domestic and feral animals?

Domestic animals are at risk and owners are advised not to allow animals access to areas where they may come into contact with brodifacoum baits or poisoned carcasses. Feral and domestic non-target deaths (cats, pigs and sheep) have been reported following both bait station and aerial applications of brodifacoum. Surveys of feral animals have shown that extensive contamination has occurred where there has been sustained use of brodifacoum.

Vitamin K is an effective antidote for domestic animals poisoned with brodifacoum.

What do I

Always contact your:

do if I suspect poisoning?

- Local doctor, or
- Local hospital or
- National Poisons Centre 0800 764 766

Who do I contact for more information?

Bay of Islands Area Office
PO Box 128
Kerikeri
phone 09 4070300

Department of Conservation
Te Papa Atawhai