

# RAT CONTROL – 1<sup>ST</sup> GENERATION ANTI-COAGULANTS IN BAIT STATIONS

**POISONS AND PRODUCTS:** (registered and available in New Zealand at 13 April 2015)

## Diphacinone

- [Ditrac® blocks](#)
- [PestOff® 50D pellets](#)
- [RatAbate® paste](#). (RatAbate® is also available as ‘Strikers’, but these and bait bags containing RatAbate® are not permitted on DoC Estate).

## Bromadiolone

- [Rid Rat® grain](#)
- [Squeak Super® grain](#)
- [Contrac® blocks](#)
- [Tomcat® blocks](#)
- [Maki® blocks](#)

## Coumatetralyl

- [Racumin® paste](#)
- [No Rats & Mice® blocks](#)

## Pindone

- [Pindone pellets](#)

## TECHNIQUE

### Bait station placement

- Place bait stations no greater than 100 x 150m apart in forest habitats, and closer where mice are also being targeted. There should be at least one bait station within each rat’s home range. Home ranges are generally reported by length. Ship rats have an average range length of 100-200m during the breeding season. Non-breeding ship rats have larger home ranges. Norway rat home ranges are between 218-916m in length [1].
- Lay the bait stations out on grids using a GPS or, in rough terrain, by placing along ridges and spurs with additional lines located on 100 m contours using an altimeter. Spacing should be established as precisely as possible using GPS. Inaccurate location of lines will cause gaps in coverage where pockets of high rat numbers can persist.
- A good track infrastructure is important and each bait station should be recorded as a GPS waypoint for ease of relocation and data collection. This reduces the risk of missing bait stations during checking and allows data collected to be related to bait stations.
- Bait stations should be attached to the dry side of trees and posts with the opening 25 -30 cm above the ground. This optimises their use by rats and avoids rain and water splashing off the ground affecting bait quality.

- If livestock are likely to be present, place bait stations out of reach. Vitamin K1 is an effective antidote for animals accidentally poisoned.
- Maintain an uninterrupted supply of fresh bait for at least 10 days, or until signs of rat activity cease.

### **Timing of operations**

- For species protection, timing is dependant on when the species being protected is most vulnerable. E.g. To protect robins during the breeding season, rat indices must be low while the robins are on the nest until the chicks fledge. To protect invertebrates and skinks, rats should be controlled year round [1].

### **Effective use of 1<sup>st</sup> generation anticoagulants**

- An excess of bait needs to be placed in the bait stations and once rats start feeding on the bait, the bait stations must be regularly refilled to ensure they are never empty. First generation anticoagulants are multiple-feed toxins. Rats must feed on the bait for at least 5 consecutive days to ensure they receive a lethal dose.
- Assuming rat numbers are high during the initial control, bait consumption will be high and gradually reduce as rat numbers decline.
- At the end of the operation uneaten bait must be collected and removed from operational area. This reduces the chance of rats being exposed to poor quality (old) bait and also minimises the time toxin is in the environment

## **EQUIPMENT**

### **Bait stations**

- Key requirements: allows rats easy access, limits access by non-targets, protects bait from the elements, limits bait spillage, no blockages, holds up to 1.5 kg of bait, easy to fill (and transport when establishing the network), durable, and designed for easy attachment.
- An example of one that fits these criteria is the large Philproof bait station.

### **Bait**

- Only freshly manufactured bait should be used. Bait that has previously been in the field must not be reused. This ensures high bait palatability, which has a direct influence on success. Old baits are likely to have mould growth and be less palatable.
- If there is any doubt about bait suitability, palatability trials and/or quality control checks (toxin concentration, mould spores, and bait hardness) should be undertaken prior to operation.

## **SUSTAINING RAT CONTROL OVER THE LONG TERM**

- Monitoring conservation outcomes is essential to judge the effectiveness of the control programme. Control operations are useless unless outcomes are achieved.
- Budget long-term for replacement of lost/damaged bait stations and track maintenance.
- It is advisable to alternate the use of different bait types, toxins, lures and trapping in ongoing control programmes. Although rats are less likely to develop bait shyness towards slow-acting anticoagulants than fast-acting poisons, the development of physiological resistance to first generation anticoagulants has occurred with repeated use overseas.

- Careful recording of the amount of toxin used and retrieved can allow better estimates of future needs.

## **LIMITATIONS**

- The method is labour intensive and relatively expensive in the first year because of initial set-up of lines and bait stations. Labour costs increase in difficult terrain.
- Baiting must be continuous over at least five days and bait stations must not be allowed to become empty during this period: this is to ensure rats ingest sufficient toxin to kill them.
- Possum numbers should be low prior to controlling rats with this method. In areas of high possum numbers, possum competition for toxic bait can reduce availability of bait to rats [2]. Possums are not particularly susceptible to first generation anti-coagulants. It may therefore be necessary to control possums first with another method.
- Rat populations bounce back within months once control is stopped [1].
- Mouse numbers may increase after rat control.
- Limited knowledge on preferred baits and lures for rats.

## **REFERENCES**

1. Innes JG (2001) Advances in New Zealand Mammalogy 1990-2000: Europeans rats. *Journal of the Royal Society of New Zealand* 31: 111-125. doi.
2. Gillies CA (2002) Managing rodents on the New Zealand mainland-what options are currently available? Summary of a workshop session at the Department of Conservation 'mainland island' hui, Omapere, 20-23 August 2001. Department of Conservation, Wellington, New Zealand: 47. 20 p. doi.