

RAT CONTROL - 2ND GENERATION ANTI-COAGULANTS IN BAIT STATIONS

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

Brodifacoum

- [PestOff[®] pellets and blocks](#)
- [Talon[®] blocks and pellets](#)
- [Final[®] All-Weather Blox](#)
- [Entrap[®] blocks](#)
- [Ratsak[®] Wax Block](#)
- [No Rats & Mice[®] blocks](#)
- [Brigand[®] blocks](#)
- [Rodenthor[®] blocks](#)

Flocoumafen

- [Storm[®] blocks](#)
- [Strategem[®] blocks](#)

Difethiolone

- [Generation[®] block and sachets](#)
- [First Strike[®] soft bait sachets](#)

USE OF 2ND GENERATION ANTICOAGULANTS ON PUBLIC CONSERVATION LAND

- Operations that plan to use 2nd generation anticoagulants are subject to a DoC policy: [“Use of second generation anticoagulants on public conservation land”](#)
- In brief, the restrictions outlined in the document are:
 - Operations are to target only rodents;
 - Use ‘captive’ baits (see below) in bait stations designed to exclude other animal pests present (especially possums);
 - Do not use where pigs are present (to avoid contamination of pig meat through pigs scavenging contaminated carcasses).

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].
- Laid out on grids by compass bearing or, in rough terrain, placed on ridges and spurs with additional lines located on 100 m contours using an altimeter. Spacing should be established as precisely as possible using compass and hip chain. 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 numbered 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.

Timing of operations

- Timing is critical and depends on what is being protected. For ecosystem management, timing should be related to rat tracking indices. 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 2nd generation anticoagulants

- Second-generation anticoagulants are more potent than first-generation. Prefeeding is unnecessary as it is a slow-acting poison and rats do not learn to avoid eating it (i.e. they do not become bait-shy).
- Most rodents will have consumed a lethal dose soon after first encountering bait, but will continue eating ‘surplus’ bait until shortly before death at 2-6 days. This is not only wasteful but can result in highly contaminated rat carcasses that pose the risk of more widespread contamination of scavengers such as pigs and harrier hawks, or domestic cats and dogs.
- A ‘pulse baiting’ strategy should therefore be used. Limit the amount of bait used such that most of it is removed in 2-3 days, and repeat after periods of 7-10 days until no further bait is removed
- At the end of the operation uneaten bait must be collected and removed from operational area. This reduces chances of rats being exposed to poor quality bait (old) and the time toxin is in the environment

EQUIPMENT

Bait stations

- On DoC-managed lands, 2nd generation anticoagulants can only be used in bait stations which: allow rats easy access, exclude possums and non-targets species, prevent bait removal, protect bait from the elements, and are durable to withstand interference by large animals such as pigs.

Bait

- Baits must be “captive” – usually using wax block baits manufactured with a hole through them, allowing a rod through the bait to attach it inside the bait station. This prevents baits being removed from the bait station. Note: waxed baits may be less palatable than non-waxed baits.
- 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.
- 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.
- 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].
- Rat populations bounce back within months once control is stopped [1].
- Mouse numbers may increase after rat control.
- The method cannot be used in areas where pigs are present as tissues (particularly liver) could become contaminated presenting a hazard to humans.
- Limited knowledge on preferred baits and lures for rats
- Second generation anticoagulants are persistent in animal tissues and can be transferred through the food chain [3]. To minimise this possibility, they should not be used long-term in a particular area, and bait stations that exclude non-target species and prevent spillage must be used.

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.
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., 47. Department of Conservation, Wellington, New Zealand.
3. Eason CT, Murphy EC, Wright GR, Spurr EB (2002) Assessment of risks of brodifacoum to non-target birds and mammals in New Zealand. *Ecotoxicology* 11: 35-48.