

RAT CONTROL - AERIAL APPLICATION OF 1080 CEREAL BAIT (with optional [deer repellent](#))

(CONTROLLED SUBSTANCES LICENCE REQUIRED)

Aerial 1080 operations are often conducted to target possums and rats simultaneously. Where rodents are being targeted specifically for eradication (especially on offshore islands), brodifacoum baits are generally used [1]: 1080 can achieve high levels of control but is less certain to achieve eradication [2].

Conduct of aerial 1080 control operations is a complex technical task that is preceded by a lengthy period of consultation with affected parties and application for permits from a number of agencies. Current best practice advice is available elsewhere with respect to the [management](#) and [conduct](#) of aerial 1080 operations.

This document summarises research findings that underpin the key technical aspects of aerial 1080 poisoning of rats. Aerial control technology is continuing to evolve with research trials indicating minimal amounts of 1080 bait being required for effective control of rats [3].

Timing of operations

- Bait acceptance is significantly higher in winter and spring [4], however, high kills have been achieved in all seasons [5].
- August-September operations, just prior to the breeding season, will maximise the benefit to native birds.
- Aerial 1080 is useful for reducing rat abundance for the duration of one bird-breeding season only [6].
- Rat populations recover within 3-5 months after the operation [7,8].

Bait

- While both “0.08% 1080 Rodent Pellets” and “0.15% 1080 Pellets” (Animal Control Products) are both effective at controlling rats [5], 0.15% 1080 pellets are recommended to prevent sub-lethal poisoning and bait shyness in non-target pests (possums).
- Two bait formulations are available: RS5, and No. 7. Generally, RS5 is favoured where a shorter exposure period required and where there is limited chance of rain or ground moisture ruining the bait on the first night. In wet forest and where a longer exposure period is sought, the No.7 bait is generally chosen.
- Baits should be ordered with [EPRO deer repellent](#) where it is necessary to minimise the by-kill of deer. Prefeed baits should also be treated with the repellent.
- Where possums are also being targeted, 20-mm baits (mean wt. ~ 12 g) should be used to reduce the likelihood of sublethally-dosing possums which is also likely to cause bait-shyness in survivors [9].

- Lure (i.e. cinnamon, orange) concentrations on baits should be 0.3% wt/wt (also referred to as double lure). The primary purpose is to mask the odour of 1080 to possums [10]. Lower concentrations of lure dissipate in storage and may result in reduced kills and bait shyness [11]. Higher lure concentrations (> 0.5%) may reduce the palatability of baits[12]. Although not experimentally investigated, it is likely that ‘lures’ may function in a similar manner for rats too as they are known to be highly attuned to the presence of toxins in baits [13].
- Green dye is included in bait as a bird-deterrent. Together with improved bait quality (i.e. greatly reduced fragmentation), this has reduced the risk to most bird species studied [14,15]. Risk assessment procedures [16] have been developed, and deterrent bait additives are being developed for some species that may be put at risk during 1080 operations, such as kea [17].
- Bait must be handled with care. Loading and unloading bags of bait should be supervised to ensure correct handling during transportation and bait is not physically damaged. Pallets of bait must not be stacked directly on top of each other. Crushed bags can produce many small pieces of bait < 0.5 g (crumbs) that may increase the hazard to non-target species[18].
- Bait must be stored in a suitable building (i.e. secure, dry, well ventilated, with a concrete floor) with no direct sunlight on stored bait. Shrink wrap around pallets should be removed to prevent the bait sweating. Correctly stored baits will remain adequately toxic and palatable (to possums: rats not tested) for 12 months [11].

Bait application

- Pre-feeding should be conducted for best results [3]. Non-toxic pre-feed bait should be the same type of bait as the toxic bait. It should not contain green dye but should contain the lure. Pre-feeding ensures a consistently high kill [5]. It reduces wariness of rats to toxic bait [19] and the likelihood of 1080 shyness occurring [7].
- Pre-feed should be applied at the rate of 2kg/ha approximately 10 days prior to the toxic bait being applied. Leave a minimum of 5 days between prefeed and toxic. The time interval should be long enough to avoid prefeed being available when the toxic bait is laid [3].
- Toxic bait should be applied at a rate of 2 - 3 kg/ha. Reasons for going over 3 kg/ha are: high numbers of possums or other animals likely to consume bait, steep/rugged terrain, or not pre-feeding. With better coverage through using GPS there appears to be no added advantage in higher rates. Competition between rats and possums for baits may influence the proportion of bait taken by rats [4].
- Flight lines for the toxic bait should follow the same path as the prefeed flight lines.
- Avoid gaps in coverage. While there is growing evidence that strip-baiting or cluster baiting along flight paths up to 150 m apart is effective [3,20], for the present it would be prudent to achieve complete coverage.
- Toxic bait should be applied during a weather forecast of at least 2 fine nights post drop. 16 mm RS5 baits begin to disintegrate after 5 mm of rain, and about 40% of the 1080 leaches out of the baits after 10mm of rain [21]. The concentration of 1080 in 16 mm Wanganui baits decreases rapidly after 10mm of rain [22]. This will increase the chances of rats being sub-lethally poisoned, causing bait shyness.

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