

# POSSUM CONTROL - BAIT STATIONS USING 1080 CEREAL PELLETS (CONTROLLED SUBSTANCES LICENCE REQUIRED)

## TECHNIQUE

### Bait station placement

- In forest habitats, place bait stations no greater than 150 m (i.e. 1/2.25 ha) apart [1]. The average home range of male possums is 1.9ha and, for females it is 1.3 ha [2]. Bait stations spaced at distances greater than 150 m will reduce the chance of all possums finding bait [3].
- If the terrain is suitable, establish bait stations on grids using GPS to locate each bait station and record its location as a waypoint. In rough terrain, locate bait stations on ridges and spurs with additional lines across the contour where possible to ensure that all possums should be within 150 m of a bait station. Spacing and locations should be established as precisely as possible using GPS: inaccurate location of lines will cause gaps and pockets of survivors.
- Possum movement on to pasture can be greatly reduced by spacing bait stations at 50-100 m intervals along the forest/pasture margins. This spacing is required to expose all possums to the bait [4] and reduce reinvasion. Most possums living in the forest within 200 m of the margin will be controlled in 1-2 weeks [4]. Many possums will travel to pasture from over 200 m inside the forest [5] necessitating ongoing use of bait stations along the margin if no control is being done further back in the forest (e.g. an aerial 1080 operation).
- Bait stations should be attached to the dry side of trees with the opening 25 -30 cm above the ground to optimise use by possums and avoid rain and water splashing off the ground affecting bait quality.
- Where weka are present bait stations must be at least 1 m above the ground.

### Bait application

- Pre-feeding must be undertaken for at least two weeks. Note: May need to be extended during wet weather or if bait stations have been raised to minimise the risk to non-target ground dwelling birds. Pre-feeding significantly increases possum kills [1]. It takes at least 2 weeks for most possums to find the bait stations [4]. Pre-feeding results in more toxic bait being eaten at a population level [1] and individually [6], it reduces wariness (neophobia) of possums to toxic bait [6], and reduces the likelihood of 1080 shyness occurring in possums that have survived 1080 poisoning [7,8].
- The pre-feeding should consist of 1.5 kg non-toxic bait per fill for high population levels i.e. > 20% RTC and 1 kg per fill for low population levels i.e. < 10% RTC. Bait stations must be checked regularly during prefeeding to ensure they do not become empty, or the bait has degraded and become unpalatable. There should be a constant supply of pre-feed in each bait station so possums learn that they are a source of food.
- Pre-feed must not be mixed with toxic bait. Remove any residual pre-feed before putting in the toxic bait. Mixing pre-feed and toxic baits can result in possums being sub-lethally poisoned and becoming bait shy.
- The quantity of toxic bait needed will depend on numbers of possums and other non-target pests i.e. rats. 500 g of 1080 bait per bait station is sufficient to control low-density possum populations (<10% RTC). Up to 1.5 kg 1080 bait per bait station will be required at higher possum densities or where high numbers of non-target pests are present. Ideally there will be a small amount of toxic bait left in each bait station after 5 nights, indicating no possums that fed there were denied a lethal dose.
- After prefeeding, use 1080 at 1.5 g/kg i.e. 0.15% 1080 pellets in either RS5 or Wanganui No. 7 formulations ([Animal Control Products](#), Wanganui). Lower 1080 concentrations may reduce

possum kills[9] and cause shyness[10], while higher concentrations may not be adequately masked resulting in 20-42% of possums eating sublethal amounts of bait [6].

- Regularly check bait stations and top up with fresh toxic bait if needed. Note: It is usually not necessary to leave toxic bait out for more than 5 nights. Most 1080 bait will be eaten on the first night [11].
- At the end of the operation all uneaten bait must be collected and removed from operational area. This reduces the chance of possums being exposed to poor quality bait and becoming bait shy through sub-lethal doses.

## **EQUIPMENT**

### **Bait stations**

- Key elements are: allow possums easy access, limits access by non-targets, protects bait from the elements, limits bait spillage, holds at least 200gm of bait, easy to fill (and transport when establishing the network), be durable and designed for easy attachment to trees and fences.
- Examples that fit the criteria are the [Kilmore](#) and large [Philproof](#) bait stations.

### **Bait**

- Bait (both prefeed and toxic baits) should be small-sized pellets (2 g). Small baits reduce the amount of spillage and allow the baits to flow to the opening of the bait station [12]
- Lure (i.e. cinnamon, orange) concentrations on baits should be 0.3% wt/wt (double lure). The primary purpose is to mask the odour of 1080, that possums otherwise detect [13]. Lower concentrations of lure dissipate in storage and can result in reduced possum kills and bait shyness. Higher lure concentrations reduce the palatability of baits [6].
- Where it is necessary to protect deer, baits should be used that contain Epro Deer Repellent (EDR). EDR is effective in deterring deer from eating baits but does not deter possums [14]. Prefeed baits should also be treated with the repellent. Cinnamon is generally used at a reduced concentration of 0.075% when deer repellent is applied to baits: operational experience indicates that it may reduce the effectiveness of the deer repellent if used at higher concentrations (K. Stafford, pers.comm.) but this has yet to be experimentally verified.
- 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.
- 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 for 12 months [15]. Old baits are likely to have absorbed moisture, have mould growth and be less palatable [6].

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

- Monitoring conservation outcomes is essential to judge effectiveness of the control programme. Control operations are useless unless outcomes are achieved.
- Pre- and post-operational monitoring is essential to determine the effectiveness of the operation. A comparison of pre- and post- data gives the most robust estimate of the kill result. Post-data cannot reliably be compared between operations.
- Reinvasion of possums into controlled areas can be reduced by using natural boundaries e.g. waterways and pasture, and treating buffer zones of at least 3km wide [16].
- Build into the costing a provision for replacement of lost/damaged bait stations and track maintenance

- Alternating bait types, toxins, lures and techniques are important in ongoing control programmes. Continuous use of a single pesticide use is not recommended. Changing method/technique completely or changing bait types and toxicants can be effective if 1080 bait shyness is present [17-19].
- Careful recording of the amount of bait used and retrieved can allow better estimates of future needs.
- While repeated use of 1080 cereal bait can be effective, the technique should not be repeated more frequently than once every 3 - 4 years unless the previous operation achieved a very high kill. Surviving possums are highly likely to be bait shy, making frequent repeated use of 1080 ineffective [20].
- Where kill rates are high, there are few surviving resident possums. Population recovery is more likely to be due to immigration (i.e. possums not previously exposed to 1080).

## 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.
- Incorrect use of 1080 cereal bait can cause bait shyness that probably lasts for the lifetime of individual possums and can be significant in a possum population for at least 3 years [21].
- Native birds may be at risk if they learn to feed from the bait stations [22].
- This technique is incompatible with other conservation work that use dogs, e.g. goat hunting, threatened species and predator work.
- Toxic carcasses can wash out of operational area posing risks to dogs.
- Community views on poisons can vary, effective consultation is required.

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