

# MANAGING RODENTS AROUND STRUCTURES WITH BAIT STATIONS

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Bait stations are devices commonly used to hold rodenticides (i.e., pesticides that control rodents) to control mice and Norway rats. (If you have Pack rats, contact the Vertebrate Pest Specialist for assistance). This document will review ways to use bait stations for the control of pest rodents around structures.

This bulletin focuses on the use of bait stations within 100 feet of a permanent structure. If you wish to learn about using bait stations to control rodents in fields, please consult the bulletin entitled "Managing Field Rodents with Bait Stations."

## Why Use Bait Stations?

Bait stations provide several key benefits, including reducing non-target access to the bait, protecting bait from weather and unwanted odors, and providing an easy way to remove unconsumed bait.

## Bait Station Types

Bait stations come in different sizes, shapes and colors (Fig. 1). Bait stations also differ in their ability to resist tampering. The Environmental Protection Agency (EPA) categorizes bait stations based on their ability to withstand tampering and weather (Table 1). Some only protect bait from dust (Tier 4), while others protect bait from children and pets (Tier 1). Select bait stations appropriate to the threats they could face. For instance, if your station will be indoors in a locked room, then you will only need a Tier 4 rated station.



Figure 1. Mouse stations (top three stations) and a rat station (bottom).

**Table 1. Rodenticide Bait Stations and Levels of Tamper and Weather-Resistance**

Bait Station Capabilities	Tier 1	Tier 2	Tier 3	Tier 4
Resistant to Children	Yes	Yes	Yes	No
Resistant to Dogs	Yes	Yes	No	No
Resistant to Outdoor Weather	Yes	No	No	No
Resistant to Indoor Conditions	Yes	Yes	Yes	Yes

However, if your station will be in a garage where children and pets can encounter the station, then choose a Tier 1 or Tier 2 station. Note: steel bait stations are available for those situations where the station could be damaged by heavy equipment, large objects, or animals.

Good tamper-resistant bait stations will have the following characteristics:

1. Adequate-sized opening to allow target animals to enter:
  - 3 inches for ground squirrels
  - 2½ inches for rats
  - 1½ inches for mice and voles.
2. Allow for convenient refilling of bait.
3. Able to protect bait from rain, snow, and ground moisture.
4. Large enough to hold enough bait to require refilling only twice a week.
5. Must be capable of being secured to prevent station upset and bait spillage by livestock, pets, wildlife, wind, and young children.
6. Designed to prevent the fingers of children from reaching the bait (typically the bait is at a 90° angle to the entrance).

## Legal Issues

Bait stations may only be used hold pesticides whose labels specifically allow for their use. Given the benefits of bait stations, it should come as no surprise that many rodenticide manufacturers mandate the use of bait stations, specifically tamper-resistant bait stations when their rodenticide is applied outdoors or where children and non-target animals may obtain access.

Consult the pesticide label of your chosen rodenticide. The label will assist you in selecting a bait station as “**The Label is the Law.**” If you have any questions about a label’s meaning, please contact the Montana Department of Agriculture (MDA) for assistance.

**Caution:** Understand that rodenticides can ONLY be used for the rodents listed on the label. For example, your label will tell you whether the rodenticide may be used on Norway rats, roof rats, house mice, or deer mice. However, if the species is not listed, such as wood rat or pack rat, then the bait cannot be used to control wood rats or pack rats.

## Bait Station Features

Manufacturers have designed bait stations with different features to meet applicator needs. The following are some of the main features available. Our focus will be on stations designed for outdoor use (Tier 1).

Bait stations may be secured against movement and shaking by soil anchors, screws, weights (Fig. 2), or magnets (Fig. 3).



Figure 2. This Bell Labs Protecta® station is secured to a concrete block.



Figure 3. The Raptor 357® bait station uses strong magnets to secure the station to metal objects.

Bait stations have features that allow them to hold snap traps (Fig. 4), bait trays, and even devices to capture other animals, such as mice.

Bait stations come in a variety of colors and shapes (Fig. 5) to help them blend in with the landscape. Some are even designed to look like utility boxes.



Figure 4. This Liphatech Aegis® bait station is opened to show how it can hold a snap trap.

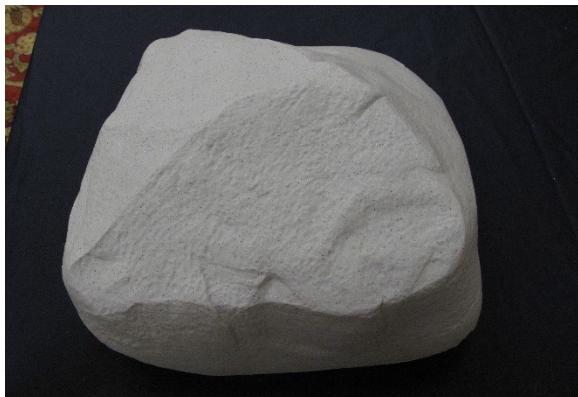


Figure 5. Bell Labs Protecta® Evo Landscape bait station.

Bait stations have locking systems designed to prevent unauthorized access to the bait. Since each brand of station has its own set of keys, we advise selecting a single brand to avoid having to carry keys for multiple bait station brands.

## Best Practices with Bait Stations

**Timing.** Use bait stations whenever rodenticides are needed and in accordance with label directions. Keep in mind, however, that different rodents behave differently around bait stations. Mice and voles will only take a few days to enter as they are curious and are willing to explore new items in their environment. In contrast, Norway

rats may wait two weeks before venturing inside a bait station.

**Location.** Place stations where rodents are active and in accordance with label instructions. Good locations can be identified by the presence of droppings. Always seek to minimize access of baits to non-target creatures. If the location exposes non-target animals to the bait, move the station to an alternative spot.

**Use Block or Soft Baits.** Use block and soft baits in stations to minimize the likelihood of mice or rats moving bait to new, unsecured locations. Block and soft baits are also less susceptible to spillage. Always monitor stations for spillage as this can occur with any bait formulation or bait station due to rodent activity.

**Anchoring.** Bait stations must be able to resist movement by non-target animals and people which could cause bait to spill out. Some of the easiest and most effective ways to secure stations include screwing them to walls or staking them to the ground. Before driving screws or hammering stakes, be sure that unseen electrical lines, pipes, will not be damaged.

**Durability.** Bait stations must be durable enough to withstand attempts by children and non-target animals to access the bait. While most settings only require the common plastic-walled manufactured stations, some situations will require steel stations. Likewise, when using inverted-T bait stations, use pipe with thick enough walls. Pipes with higher schedule numbers will have thicker walls.

**Caution:** Baits stations **MUST** be strong enough to resist access by non-target animals in your area. This means, if raccoons, large, free-range dogs, or bears occur in your area, your station must be strong enough to resist those animals. When in doubt, choose stronger stations. While professionally manufactured plastic outdoor stations are typically strong enough to protect bait against raccoons and dogs, steel bait stations may be a better choice. Ultimately, it is your responsibility to use the bait station strong enough

and anchored securely enough to withstand assaults from non-targets in your area.

### Methods not Recommended

**Pre-Baiting.** Pre-baiting is the practice of filling stations with non-toxic bait with the goal of encouraging rodents to use the station. Once the rodents are comfortable, toxic bait is applied. In general, pre-baiting is not necessary (unless required by the label) and can delay control efforts. If consumption of toxic bait is lower than expected, consider the possibility that the bait was contaminated by pesticides, foreign odors, or has become stale. You should also ensure that the location of the bait station is where your target animals can find it.

**Scattering Bait Before Station Entrance.** Bait (toxic or not) should not be scattered outside the station to lure animals to the station (Fig. 6). Placing bait outside the station defeats its purpose by increasing hazard to non-target animals and exposing the bait to weather.



Figure 6. Grain bait outside the bait station.

**Altering Bait.** Some may suggest adding various substances to toxic baits in the hope of increasing acceptance of bait. We do not recommend altering baits as changes will likely reduce rather than increase consumption. For example, some recommend adding salt to increase bait acceptance. Studies have shown lightly salted bait is no better accepted than unsalted bait. In fact, overly salted bait is likely to reduce bait consumption.

### Best Use of Toxic Baits

Rodenticide baits are classified as either anticoagulant or non-anticoagulant. Different categories of baits work in different ways. It is critical to use them correctly and to avoid using the same active ingredient for multiple years to reduce the risk of rodents becoming resistant to the toxicant.

Anticoagulants inhibit the ability of the blood to clot and cause death by internal bleeding. Anticoagulants are further divided into first and second generation anticoagulant rodenticides. First generation anticoagulant rodenticides (FGARs) are known as multi-dose because rodents must feed on the bait on several occasions to receive a lethal dose.

- First-generation anticoagulants include the active ingredients, warfarin, chlorophacinone, and diphacinone. Since rodents must feed on the bait several times to achieve a lethal dose, it is essential that bait remains available. Failure to maintain the stations may result in rodents receiving a less-than-lethal dose, causing them to only get sick, and therefore avoiding the bait in the future.
- Second-generation anticoagulant rodenticides (SGARs) are known as single-feed because rodents only need to feed once to receive a lethal dose. Second-generation anticoagulants include brodifacoum, bromadiolone, difenacoum, and difethialone.
- Non-anticoagulants (NAs) kill rodents by means other than bleeding. Non-anticoagulants include bromethalin, cholecalciferol, and zinc phosphide. Bromethalin disrupts the nervous system of the rodent that consumes it. Cholecalciferol increases calcium levels in the blood damaging the heart and kidneys. Bromethalin and cholecalciferol require several days to kill rodents. In this regard, they are like anticoagulants in that time is required to achieve lethal results. Zinc phosphide causes heart failure and typically kills rodents within one day.

## Best Use of Anticoagulants

When using anticoagulant baits, whether first or second generation, you must be patient. All anticoagulants act slowly. It may take three to five days of feeding before the rodent succumbs. It is critical to follow label recommendations for bait station maintenance. Failure to follow station maintenance recommendations will likely result in reduced efficacy.

Most treated animals will die in or around their dens. The claim that rodents eating bait will go outside for water is false. Usually, homeowners will not notice an odor from the decaying rodents. But odors can occur if rodent deaths are high and/or the rodent(s) die(s) in an area where the odor can reach sensitive noses. Some will die in exposed locations, presenting a hazard to scavengers that may eat the carcasses. Reduce non-target exposure to secondary poisoning by monitoring the treated area for carcasses and disposing of them according to label instructions.

### SideBar: Contrapest® and Evolve™

Contrapest and Evolve are pesticides labelled to control Norway rats. Unlike other pesticides used in rodent control, these products do not kill rats. Instead of killing, they prevent reproduction in rats. As long as rats continue to feed on the bait, they cannot produce young.

## Best Use of Zinc Phosphide Baits

Zinc phosphide-based baits are fast acting baits that only require one feeding to kill rodents. Symptoms of poisoning occur shortly after ingestion often within 12 to 48 hours.

Some rodents exposed to zinc phosphide may become sick and stop eating before consuming a lethal dose. Survivors exposed a second time to the bait may associate their sickness with the bait and reject it, becoming bait shy. Because of this, baiting more than once per year is not recommended. Zinc phosphide is sensitive to moisture so be sure bait stations will protect bait from rain and snow.

## Station Placement

Place stations where the target rodents are found, while following label guidelines. Typically, labels only allow stations to be placed within 100 feet of a permanent structure. Avoid making rodents “work” to find the stations. Failure to place the proper amount of stations increases the likelihood that the rodents will consume the bait before it’s replenished. Bait consumption is typically high at first, so frequent station maintenance is required in the early phases of a control campaign.

## Purchasing Bait Stations

Bait stations are available from many outlets including, pesticide dealers, online stores, and pesticide manufacturers. An applicator’s license is not required to purchase bait stations. However, some pesticide dealers may have company policies that require buyers to have a pesticide license. While rodenticide manufacturers would prefer you to purchase their bait stations, you are not obligated to do so. Rodenticide baits from one manufacturer may be used in the bait station of another manufacturer. If you are using liquid rodenticide bait, be sure that the station you are purchasing is designed for liquid baits before purchasing.

Bait stations are sold in various colors, shapes, and security features. We suggest looking at a few different brands of bait stations before making a final purchase. While most bait stations are constructed with rigid plastic, steel stations are available and should be used in areas where weaker stations will not withstand non-target pressure.

## Build Your Own Bait Stations?

You are allowed to build your own bait stations provided that your station(s) meet(s) the protective requirements mandated by the pesticide label of the bait you are wanting to protect. Typically, stations must be able to resist access to young children and non-target animals. Keep in mind this means the station should be

secured so that children or animals are unable to shake bait loose from the station.

Practically speaking this requires that stations be designed to prevent children from being able to reach inside a station to access bait. Use strong materials such as plywood or  $\frac{1}{2}$ -inch thick wood or similarly strong material. The lid should be connected to a clasp that can be padlocked to prevent unauthorized opening. Typically, manufacturers use distance and 90-degree angles to prevent children from being able to reach the bait (Fig. 7). Entrances to the bait stations should be only as large as needed for the target animal. For mice, make openings 1 $\frac{1}{2}$  inches in diameter and for rats 2 $\frac{1}{2}$  inches in diameter.

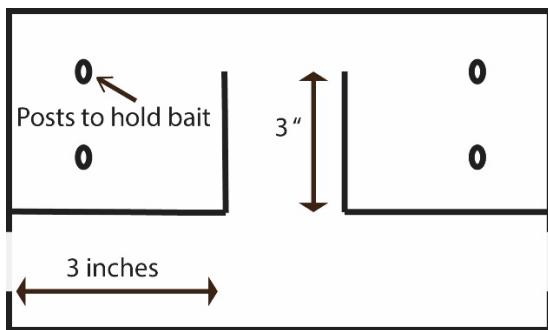


Figure 7. Diagram of a homemade tamper-resistant bait station (ground squirrels).

Avoid using loose-grained bait as it can be shaken from the station and rodents will relocate the bait to unsecured areas.

## Concluding Thoughts

Bait stations help protect non-target wildlife and domestic animals from gaining access to rodent baits. When using bait stations, particularly in areas open to public access, it is advisable to place warning signs on the stations which identify the stations as containing poison bait, the active ingredient and where to obtain further information.

Before using these or any other pesticide products carefully read and understand the pesticide label. When not in use, store pesticides in the original labelled container and in a locked, dry, and cool storage area.

## Department Services

Control of vertebrate pests is most effective when all affected landowners work together. The Montana Department of Agriculture Vertebrate Pest Specialist program will work with county commissioners, extension agents and landowners to establish a program suited to local and county needs. Field demonstrations are provided free of charge to inform landowners how, when, and where to control rodents and other damaging vertebrate pests. Interested individuals should contact the Montana Department of Agriculture.

### In Lewistown:

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Additional printed information on the control of rodents and other vertebrates is available from the Montana Department of Agriculture website <https://agr.mt.gov/Vertebrate-Pests>

MONTANA POISON CONTROL (Emergencies) 1-800-222-1222

MONTANA DEPARTMENT of PUBLIC HEALTH & HUMAN SERVICES Injury Prevention Program 1-406-444-4126  
<https://dphhs.mt.gov/publichealth/EMSTS/prevention.aspx>

Disclaimer: Reference to commercial products or trade names is made with the understanding that no discrimination is intended of those not mentioned and no endorsement by the Montana Department of Agriculture is implied for those mentioned.

### Credits

Figs. 1-5. Wildlife Control Consultant, LLC  
Figs. 6-7. Stephen M. Vantassel, Montana Department of Agriculture.

### Acknowledgements:

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