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Bait Stations for Controlling Rats and Mice

Stephen Vantassel, Extension Wildlife Damage Project Coordinator
Scott Hygnstrom, Extension Vertebrate Pest Specialist
Dennis Ferraro, Extension Educator

Bait stations increase both the effectiveness and safety of the toxic baits used to control rats and mice. Learn how to build, bait and position bait stations around your home and farm to maximize rodent control.

Toxic baits are often used to reduce the damage caused by Norway rats (*Rattus norvegicus*) and house mice (*Mus musculus*). Bait stations used in rodent control programs increase both the effectiveness and safety of rodent baits (rodenticides).

Bait stations are useful because they:

- protect bait from moisture and dust;
- provide a protected place for rodents to feed, allowing them to feel more secure and consume more bait;
- keep nontarget species, including pets, livestock, wildlife, and children away from toxic baits;
- allow bait to be placed in otherwise difficult locations given weather or potential hazards to nontarget animals;
- help prevent accidental spillage; and
- offer the applicator easy access to bait, making it easier to determine the amount of bait consumed by rodents, and to refill.

Types of Bait Stations

To meet the variety of demands for rodent control, manufacturers have developed designs for several bait stations. The designs are based on whether the station needs to:

- target rats or mice,
- contain solid (pellets and block) or liquid bait,
- sustain indoor or outdoor use,
- resist tampering,
- hold traps (snap and glue) (*Figure 1*).

Stations also differ in the type of materials used for their construction, including plastic, metal and other materials.

Figure 1. AEGIS™-RP Bait Station (Liphatech, Inc.) holding a glueboard. Many manufactured bait stations are designed with the flexibility to be used with traps, glueboards and toxicants.

To protect people and nontarget species, the United States Environmental Protection Agency (EPA) mandates that a commercially produced bait station meet eight safety criteria before it receives the designation "tamper resistant." The complete EPA Pesticide Registration Notice can be obtained at *http://www.epa.gov/PR_Notices/old/pr94-7.html*. Tamper resistant stations must be:

1. Resistant to destruction or weakening by weather.
2. Strong enough to prohibit entry or destruction by dogs or children under 6 years of age using their hands, feet or objects.
3. Capable of being locked or sealed.
4. Equipped with rodent entrances that readily allow target animals access to baits but deny access to larger animals and birds.
5. Capable of being anchored (and must be anchored when used).

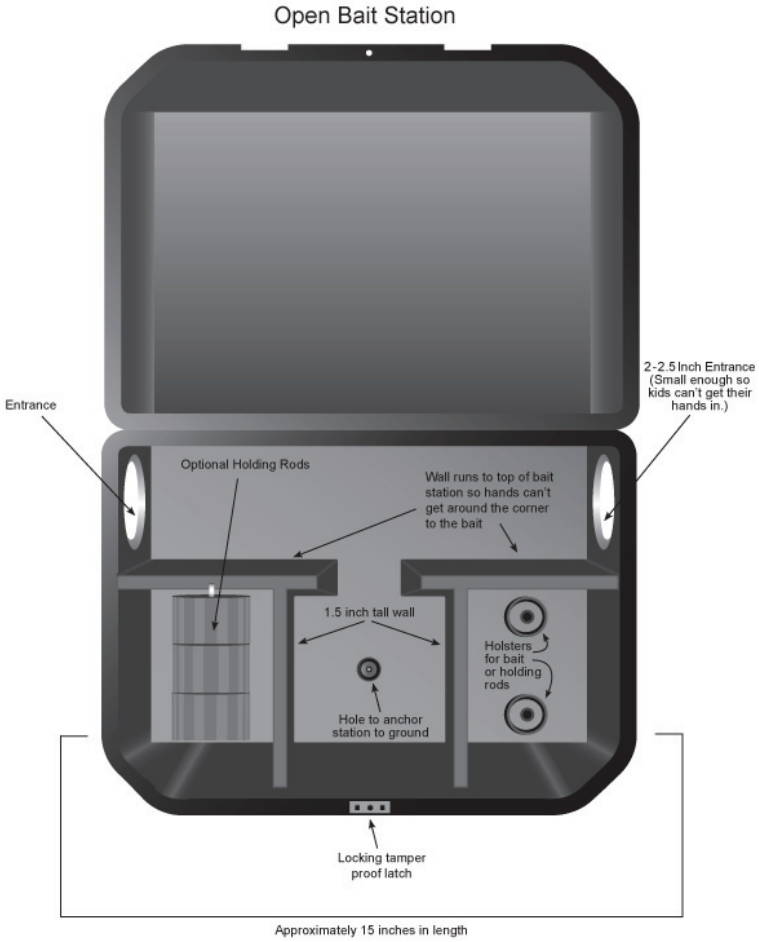

Diagram 1. Open bait station illustrating entrance holes, interior walls, holding rods, anchor points and locks.

6. Equipped with internal structures for containing baits and minimizing spillage and tracking of bait outside of the station or into readily accessible parts of the station.
7. Made of design and color not especially attractive to children.
8. Capable of displaying precautionary statements in a prominent location.

Manufacturers meet the safety criteria by constructing bait stations out of sturdy plastic, designed with two chambers positioned in a way that forces the rodent to take a 90 degree turn to access the bait *(Diagram 1)*. Finally, the station must be securable to the floor, heavy patio stone or a wall to prevent the bait from being removed by shaking. If the station is in proximity of hoofed livestock or wildlife, such as raccoons, stronger building materials (aluminum) may be needed.

The color of the bait station plays a critical role in station success when used outside. When placed in direct sunlight, black and clear stations become solar collectors. Internal station temperatures can reach as high as 165°F and melt the bait. Also, clear plastic stations have been known to become brittle during freezing temperatures. If stations are to be placed in areas exposed to direct sunlight, choose those that are gray or white.

Manufactured bait stations are available through vendors of farm and chemical supply stores or can be ordered through the Internet or pest management suppliers.

Building Your Own Bait Station

If you prefer to construct your own bait station, it is strongly recommended that you consider the safety of nontarget species and strive to meet the federally mandated safety standards. Use sturdy materials to prevent damage to the station. Where children and livestock are present, the station should prevent unauthorized access and/or removal of the toxicant. Locks or concealed latches are often used to make the bait station more tamper-resistant. Clearly label all bait stations with *"POISON," "RODENT BAIT —DO NOT TOUCH,"* or a similar warning. You can create your own warning labels on the Internet. Search for this free service by using the key words "warning label generator."

In secure areas where the risk of nontarget exposure is low, station design can be as simple as a flat board nailed at an angle between the floor and wall, or a 4-inch diameter corrugated PVC pipe (24 inches long), into which bait can be placed *(Diagram 2)*. Cigar boxes (10 x 6 x 2 inches high) are ideal for mice when used in secure, indoor locations. More elaborate stations are completely enclosed and can contain liquid as well as solid rodent baits. Hinged lids allow convenient inspection of stations in permanent settings. Your design must take into account the rodenticide's label requirements and relative risk for nontarget exposure. It never hurts, however, to be more restrictive than the label requires.

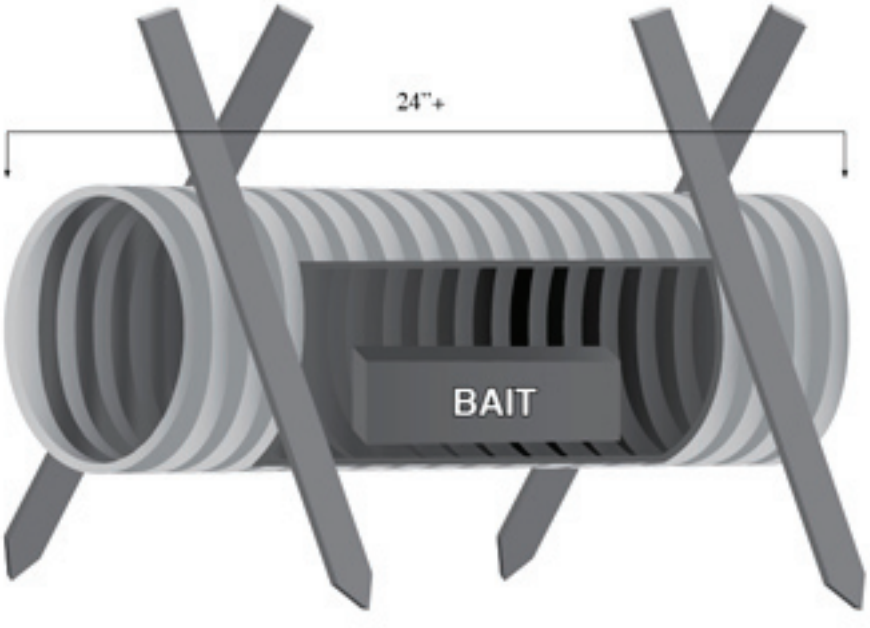

Diagram 2. Homemade bait station. This station can be used with pellet or block bait. If using bait blocks, use a wire or long rod to hold bait in place.

Bait stations should be large enough to allow several rodents to feed at once. The following dimensions can be used as minimum standards.

	Hole size	*Length*	*Width*	*Height*
Rats	2¼"	12¼"	11.0"	3.0-4.0"
Mice	¾"	5¼"	3¾"	1¼"

Construct your station with at least two openings on opposite sides. Rodents are more likely to enter a station if they sense an alternate escape route. Research has shown that mice prefer to enter a low-profile station, but the precise reason for this behavior is unknown.

Many manufactured bait stations are designed to hold snap traps, glueboards, and rodenticides. Some stations hold liquid toxicants as well. Consider designing your bait stations to house multiple control tools.

Bait Selection

Bait stations work best when used with commercial rodent baits. Today, most of these baits are anticoagulant rodenticides. For these baits to be effective, rodents must feed on them over a period of days. Baits are available in several forms — loose grain, pellet-grain mixtures, paraffin-grain blocks, extruded blocks, and water-soluble concentrates. The best approach is to use extruded bait blocks that can be anchored inside the bait station to prevent them from being removed. Loose grain and pelleted baits are often sold packaged in small "place packs" that can be placed intact into the bait station. Use caution with loose and pelleted grain formulations of toxicants, as rodents may relocate them to unsafe areas.

Liquid baits work well in locations where rodents have few water sources, such as granaries. Simply mix the dry concentrate with a measured amount of water to create an enticing rodent bait. Rats will often come to water stations because they need water daily unless they are feeding on very moist food. Although mice can survive without drinking water, they will use it when it is available. Because many nontarget animals drink water, receptacles containing liquid rodenticides should be enclosed within bait stations to reduce hazards to pets, livestock, and wildlife.

See *Controlling House Mice* (G1105) and *http://icwdm.org* for additional information on types and selection of baits.

Bait Station Placement

Proper placement of bait stations is just as important as using the appropriate bait. Rats and mice will not visit bait stations, regardless of their contents, if they are not conveniently located in areas where rodents are active.

When possible, place the stations between the rodents' food supply and their shelter. Position bait stations near rodent burrows, against walls, and along their travel routes. Look for signs of activity such as droppings, gnawing, tracks, and rubmarks to help identify sites to place bait stations. Rodents usually will not go out of their way to find baits. House mice seldom venture more than 50 feet from their nests or food, so place bait stations no more than 12 feet apart in areas where mice are active. Norway rats will travel up to 100 feet from their nests so rat stations can be placed 15 to 50 feet apart. It is important to be patient when controlling rats. Rats are often suspicious of new or unfamiliar objects. Do not be surprised if it takes up to two weeks for rats to enter and feed in recently placed bait stations. Landscape versions of bait stations are available that look like rocks, thereby blending in with overall surroundings.

On farmsteads, placement of bait stations depends on building design and use. In swine confinement buildings,

Figure 2. Rat bait station properly placed against the exterior wall of a building.

it may be possible to attach bait stations to wall ledges or to the top of pen dividing walls. Bait stations also can be placed in attics, along walls, or in alleys where rodents are active (*Figure 2*).

Never place bait stations where livestock, pets or other animals can disturb them. Spilled bait may pose a potential hazard, particularly to smaller animals. Rodent baits are poisonous to all animals, in varying degrees. Swine and dogs are especially susceptible to anticoagulants.

Permanent bait stations can be placed inside buildings and along the outside walls of buildings that are not rodent-proof. Avoid placing stations away from structures, such as along fencelines or the perimeter of the property. Perimeter placements may endanger nontarget species, while not substantially increasing target species control. Bait stations, however, may be necessary along the perimeter when structures are within 25 yards of thick vegetative covers and there is a large rodent population.

Bait Station Maintenance

Maintain the bait stations regularly with fresh anticoagulant bait to keep rodent numbers at a low level, as rodents will move in from other areas. When using baits, monitor their freshness and quality, as rats and mice will often reject spoiled or stale foods. Provide enough fresh bait for rodents to eat sufficiently, but don't overfill bait stations. When initially positioning bait stations, check them daily and add fresh bait as needed. After a short time, rodent numbers and feeding will decline, and surveillance of stations will only be necessary every two weeks or so. If the bait becomes moldy, musty, soiled, or insect-infested, empty the bait station, clean it, and refill it with fresh bait. Always wear appropriate safety equipment as specified by the label, including disposable gloves, glasses/goggles, and a mask during the cleaning process to protect yourself from exposure to the toxicant and rodent excrement in the station. Dispose of spoiled or uneaten bait in accordance with the label. If possible, dispose of the spoiled toxicant at a qualified toxic-waste facility. If ants are a problem, treat the station interior (especially the bait tray) with a low-odor, liquid pyrethroid insecticide. Let the insecticide dry before filling the station with toxicant. Insecticides will not likely deter rodents, provided that the insecticide is applied at labeled rates. Another option is to sprinkle insecticide granules on and around the immediate area before placing the station. Never directly treat rodent bait with insecticide. Always *follow all label directions* for the products you are using.

Safety

Follow all safety guidelines when handling pesticides. Wear latex, nitrile or vinyl gloves when handling all toxicants. Avoid breathing dust when pouring granulated-pelletized pesticides. Don't smoke, eat or drink when handling pesticides. When finished applying toxicants at a location, wash your hands and face thoroughly and change your clothes. These pesticide precautions are also helpful in protecting yourself from biological hazards, such as salmonella. Deer mice, a species known to carry Hanta-virus, commonly take up residence inside empty stations. Avoid stirring up dust when opening. Hanta-virus can be disinfected with a 10 percent bleach solution or with Lysol®. For more safety information please consult *Controlling House Mice* (G1105) or visit the Centers for Disease Control Web site *http://www.cdc.gov*.

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