3-1-1980

Controlling Rats and Mice

Purdue University Cooperative Extension Service

For current publications, please contact the Education Store: https://mdc.itap.purdue.edu/

This document is provided for historical reference purposes only and should not be considered to be a practical reference or to contain information reflective of current understanding. For additional information, please contact the Department of Agricultural Communication at Purdue University, College of Agriculture: http://www.ag.purdue.edu/agcomm

This document has been made available through Purdue e-Pubs, a service of the Purdue University Libraries. Please contact epubs@purdue.edu for additional information.
Controlling Rats & Mice

Developed cooperatively by the U.S. Fish and Wildlife Service and Purdue University Cooperative Extension Service.

Commensal Rodent Control

The Norway rat, black rat, and house mouse (Family Muridae) are generally referred to as commensal rodents.

These animals are not native to the Americas. The black rat probably reached North America from Europe prior to 1700. The Norway rat and house mouse invaded the United States about 1775.

Each year rats and mice eat or contaminate vast quantities of food, feed, and fiber originally intended for man's use. In addition, rats act as a vector for about 46 different diseases that affect man or his domestic stock. The Norway rat is credited with causing more deaths than all the wars of history.

Rats and mice have very poor eyesight with clear vision limited to less than a foot. However, they can detect motion several feet away. Their other senses—taste, touch, hearing, and smell—are very well developed. They are also excellent climbers, swimmers, and jumpers. An adult rat can reach about 18 inches, jump two feet vertically and eight feet horizontally.

Norway rats prefer to live at or below ground level and will burrow under shallow buildings foundations to gain entrance. Black rats are more arboreal and will generally be found in the upper stories of buildings.

One way to distinguish the Norway rat from the black rat is by their tail length. The black rat's tail is longer than its head and body. The Norway rat's tail is shorter than its head and body.

Control

A complete rat and mouse control program requires three steps: sanitation; rodent proofing; and population reduction. Unless all three steps are followed to completion, little if any long-term control will be achieved.

Sanitation

The first step in rat and mouse control is a cleanup program. Rats can find shelter in or under old lumber piles, stacked firewood, piles of old papers, boxes, bags, broken-down sheds, trash dumps, abandoned vehicles, or other trashy areas. All such areas must be eliminated. Once all areas of potential rat harborage outside have been cleaned up, check inside such places as grain bins, barns, poultry houses, and main buildings. Any accumulation of trash, garbage, or spilled feed should be cleaned up. Particular attention should be payed to areas of reduced accessibility such as under sinks or behind large appliances—washers, dryers, stoves, freezers, etc. Small quantities of livestock feed or garden produce should be stored in large metal cans with tight covers. Large quantities should be stored on raised shelving or in rat proof feed bins.
A good cleanup program will greatly reduce rat and mouse problems. But, remember, this must be an ongoing program—once an area is cleaned up, keep it clean.

Reducing or eliminating rat or mouse food and cover without reducing their numbers will only spread the problem. Therefore, the sanitation and population reduction programs should be conducted simultaneously.

Rodentproofing

Rodentproofing means stopping the movement of rats and mice into buildings or other areas where they are not wanted.

Young rats can squeeze through an opening 1/2 inch in size, mice through a 1/4 inch opening. Some of the more common points of entrance are through poorly fitting doors and windows, holes around lead-in pipes and wires, vents, cracked siding, joints between building foundations and walls. All such openings should be closed using sheet metal, hardware cloth, or cement, as situations warrant. Doors and windows should be adjusted to close tightly.

Any sharp corners that offer a biting surface should be sheathed with sheet metal. Where feasible, building foundations should extend 36 inches into the ground or in an "L" shape 24 inches deep and 12 inches out. Double walled buildings need special treatment to keep rats and mice out. This space may be closed by using cement or sheet metal to close openings at the wall and floor junction.

Population Reduction

Anytime population reduction is used as a control tool, the annual natural mortality must be exceeded or no overall reduction of the population will be achieved.

There are six methods generally used for population reduction: shooting, trapping, glue boards, burrow fumigation, tracking powders, and oral toxics. CAUTION: BEFORE USING ANY PESTICIDE, READ THE LABEL AND FOLLOW ALL MANUFACTURERS DIRECTIONS FOR USE AND PLACEMENT. NEVER PLACE ANY POISON WHERE IT IS ACCESSIBLE TO CHILDREN, DOMESTIC ANIMALS, OR NON-TARGET WILDLIFE.

Shooting rats can provide good target practice; however, it is not a very effective means of population reduction. Also, in some areas it may be illegal to discharge firearms in or around buildings.

Trapping is a practical way of removing rats and mice. It is particularly useful where the exposure of poisons might be hazardous or where odors from dead animals would be objectional. One of the most effective and versatile traps is the wooden-based snap trap. The most common mistake made when using traps is not using enough of them. If too few traps are used, a trapping program will have little or no effect on rat or mouse numbers. For more information on trapping, see leaflet AC 320, Trapping Rats and Mice.

Glue boards involve the use of non-toxic sticky substances similar to flypaper to catch rats and mice. The glue is spread on squares of tarpaper or heavy cardboard which are then laid in active runways. As the animals become trapped, they can be killed, rolled up in the paper and disposed of. Glue boards do not work well in dusty areas. They are well suited for use in food handling establishments.

There are several chemicals or combination of chemicals, federally registered for use as fumigants against commensal rodents. All but two of them may only be used by certified applicators. Fumigants should never be used where there is danger of people or non-target animals coming in contact with the gases. Because of the high toxicity and hazards involved in the use of fumigants, this control method should only be used by or under the direction of competent professional applicators.
Tracking powders work by having the animal come in contact with it, when the rat or mouse cleans itself, it ingests the poison. Tracking powders should never be used in areas where there is any danger of the powder coming in contact with food or surfaces that might come in contact with food.

There are two general types of oral poison—single-dose and multiple-dose poisons.

Killing success with single-dose poisons depends on the animal consuming a lethal amount at one meal or before the onset of poisoning symptoms. Acceptance of single-dose poisons can be greatly increased by prebaiting with unpoisoned food for several days before the actual poison is put out.

Many single-dose toxicants will kill any animal that eats a lethal dose. Therefore, they should be used only with extreme caution. Professional advice and/or assistance should be sought before using a single-dose poison.

Anticoagulants (multiple-dose poisons) prevent normal blood clotting. This causes the animal to die from internal hemorrhaging. Killing success with anticoagulants depends on the animal consuming a small dose for several consecutive days (rats for 7 to 10 days, mice for 10 to 15 days). Because of the mode of action and low concentration of actual toxicant, anticoagulants are relatively innocuous as compared to single-dose poisons.

Because of the long feeding time required to be effective, anticoagulants should be mixed with a bait that will retain its taste and odor for several weeks. The following bait mixture is suggested as an ideal all-purpose bait for rats and mice.

Water-soluble forms of anticoagulant poisons may be used to supplement dry baits. They appear to be most effective during the summer months or in locations where water is not readily available. In many places it will be advantageous to expose a

<table>
<thead>
<tr>
<th>Bait</th>
<th>Rats and Mice</th>
<th>Mice Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fresh ground yellow corn</td>
<td>13 lb</td>
<td>6 lb</td>
</tr>
<tr>
<td>Rolled oats</td>
<td>4 lb</td>
<td>2 lb</td>
</tr>
<tr>
<td>Powdered sugar</td>
<td>1 lb</td>
<td>1/2 lb</td>
</tr>
<tr>
<td>Vegetable oil</td>
<td>1 lb</td>
<td>1/2 lb</td>
</tr>
<tr>
<td>Anticoagulant concentrate*</td>
<td>1 lb</td>
<td>1 lb</td>
</tr>
<tr>
<td>Total Bait</td>
<td>20 lb</td>
<td>10 lb</td>
</tr>
<tr>
<td>Liquid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water soluble anticoagulant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>concentrate*</td>
<td>1 qt</td>
<td>1 pt</td>
</tr>
</tbody>
</table>

*NOTE: Quantities and concentrations of anticoagulant rodenticides may vary, so use the proportions recommended on the manufacturer's label.
water bait alongside a dry bait. Even the exposure of unpoisoned water in this manner will often improve acceptance of the food baits.

For maximum effect, single-dose toxicants should be exposed for 24 to 48 hours, this will eliminate the majority of the rodent population. After the single-dose toxicant is picked up, an anticoagulant bait should be exposed for 7 to 10 dys for rats and 10 to 15 days for mice. This should eliminate almost all of the rodent pests. No toxic bait is one hundred percent effective. Trapping is necessary if every last rat or mouse is to be removed.

Bait Stations

There is no such thing as a "safe" poison—all rodenticides can kill humans, domestic stock, and non-target wildlife. All poisons should be put out in bait stations. The use of bait stations reduces the accessibility of the poison to non-target animals and children. Also, they provide the cover preferred by rats and mice when feeding. For information on the constructions and placement of bait stations, see leaflet AC 319, Controlling Rats and Mice—Use of Bait Stations.

A listing of federally registered commensal rodenticides for use in and around buildings is available upon request.