

Rat Control in Alberta

Albertans have enjoyed living without the menace of rats since 1950, when the provincial rat control program was established. Norway rats are well known to be extremely destructive creatures. The economic losses they cause to stored and infield crops, the destruction of property and their effects on human health have been widely documented for decades.

Losses caused by rats can be divided into three categories:

- losses to food stuffs – consumption and contamination
- damage caused by gnawing and tunneling
- disease transmission

Life history

The Norway rat (*Rattus norvegicus*) is a shy, secretive and primarily nocturnal animal (Figure 1). It seeks shelter not so much to keep warm but to hide from enemies including other rats.

A rat shelter can be almost any object rats can crawl under including planks, plywood, buildings or structures resting on the ground.

Once secure, rats will quickly seek food. The diet of a Norway rat is remarkable; it can survive on a wide range of food items from domestic garbage, rotten meat and



Figure 1. Norway rats.

fish, stale grain, greenfeed and straw to fresh fruits and vegetables, packaged foods, sugar and candies.

Following about a 3-week gestation period, 12 to 18 rats are born to a female rat that can be as young as 8 weeks of age. A Norway rat can produce up to 12 litters per year. Male rats are sexually mature at approximately 90 days of age. Norway rats may live up to 18 months in the wild.

It has been estimated that, under ideal conditions, a single pair of Norway rats could produce 15,000 offspring in 1 year.

Identification

The Norway rat has a number of recognizable characteristics. It is approximately 22 cm in body length and light brown, has small ears and a tail not as long as its body (Figure 2).



Figure 2. Norway rat, brown rat, sewer rat.

Weight – An adult male Norway rat weighs an average 450 grams (1 pound); females weigh slightly less.

Length – Average length of an adult Norway rat, body only, (from nose-tip to base of tail) is 18 to 25 centimetres (7 - 10 inches).

Colour – The Norway rat has a wide range of colours from reddish to greyish brown or completely black on the back and sides. The underparts are tinged with grey to a buff or yellowish-white. White, spotted and “laboratory” rats are only colour variations of the Norway rat.

Feet – Both front and hind feet of a Norway rat are small, delicate and pink (Figure 3).

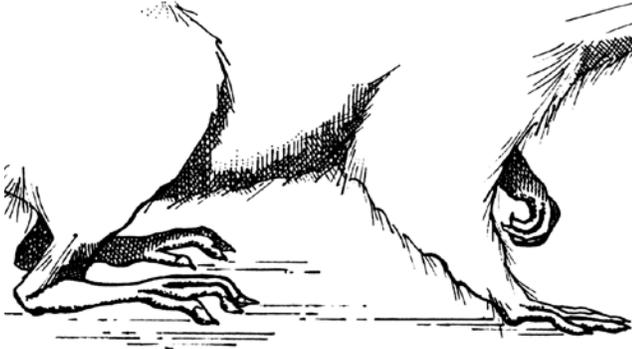


Figure 3. Detail of front and hind feet.

Eyes - In comparison to other rodents, Norway rats possess small eyes, which are shiny black.

Nose - The nose is somewhat blunt, pinkish and inconspicuous.

Ears - The ears of a Norway rat will not cover the eye when pulled down do not reach the eyes as in most other rat species (Figure 4).

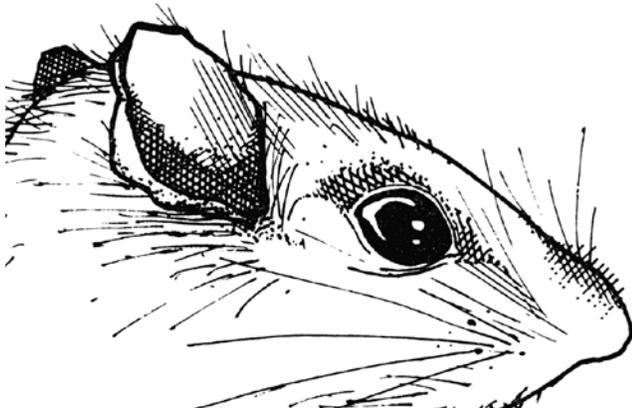


Figure 4. Detail of ears and eyes of the Norway rat.

Tail - The most distinguishing feature of true rats is the tail (Figure 5). The Norway rat’s tail is cylindrical, tapering and nearly hairless. The hairs on the tail are short and bristle-like and grow out from well defined hairline ridges along the entire length of the tail.

The length of tail is about 15 to 22.5 centimetres (6 - 9 inches), and the tail is **always** shorter than the body.

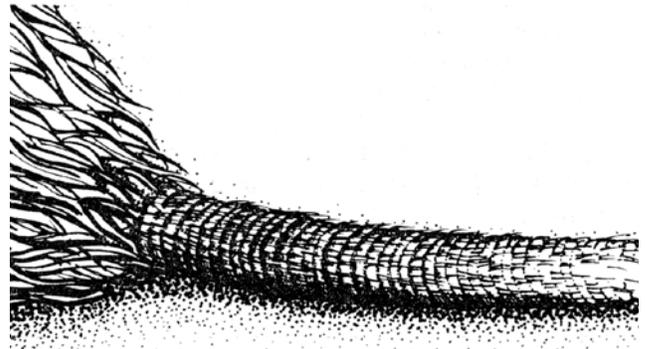


Figure 5. Detail of the tail of the Norway rat.

The roof rat (*Rattus rattus*) is similar to the Norway rat but a little smaller and darker, and its tail is longer than its body (Figure 6). The roof rat’s ears are larger than a Norway rat, but the rats are otherwise very similar. The roof rat has not been able to establish populations on the prairies, and most often, a roof rat found in Alberta arrived via transport vehicles from the west coast.

The roof rat is approximately 20 cm in body length and dark brown. It has large ears and a tail longer than its body.



Figure 6. Roof rat, black rat, ship rat.

Recognizing rat presence

Burrows and runways

The cylindrical burrow entrance of a *Rattus* rat in soil or in straw or hay bales measures about 5 to 7.5 centimetres (2 - 3 inches). Unlike native rodents, the burrow entrance of a rat is clean of debris and excavated soil particles.

Rats leave well beaten trails about 5 centimetres (2 inches) wide from their nest areas to food and water sources. Rats often dig lengthy travel runs under objects such as bales, planks, granaries, plywood and even idle machinery to move from area to area.

Wall and floor holes

The average size of the circular-shaped rat hole in walls and floors is 5 to 7.5 centimetres (2 - 3 inches) in diameter, but can be considerably larger, depending upon the material. Rats will make holes in walls or floors soon after invasion; wall holes are usually just inches above the floor. Holes in floors are generally close to walls or under supporting skids or poles.

Gnawing

Rats must chew continuously to wear down incisor teeth (front teeth) that grow an amazing 5 to 10 cm (2 - 4 inches) per year. Most often, rats will chew materials close by such as plywood, structural woodwork, plastic paneling, frozen ground and even concrete.

Droppings

Rats produce up to 25,000 droppings per year, so they can usually be detected if they have been present for even a short time. Rat droppings are blunt at both ends and the shape and size of an olive pit, measuring 1.25 to 1.5 centimetres (.5 - .75 inches), and shiny black (Figures 7 and 8). Droppings fade in time and soon turn to grey-white.



Figure 7. Actual size of mice droppings (left) versus rat droppings (right).



Figure 8. Rat scat on left compared to mouse scat on the right.

Nests and caches

Rattus rats are ground dwellers, so their nests and caches are built on or below ground level. The nest of a rat can consist of almost any material, usually food remains and other available items such as paper, straw, cardboard, rags or shredded plastic bags. Rats may hoard and cache food, which may or may not be eaten.

Odours and smudges

The distinctive, musky odour of rats can be easily detected, particularly if rats are confined to a small area. The oily hair of a rat leaves noticeable smudge marks on trails or at hole entrances. The combination of oily hair, dust and dirt results in obvious dark-stained surfaces.

How to control rats

Rat infestations can be prevented by any of three methods: food source removal, rat shelter removal, rat proofing.

Food source removal – Because rats are capable of eating almost anything, it is important to remove all possible food items such as garbage, empty food containers, spilled grain or feed. Do not give rats a chance – **Remove any and all food items.**

Remove rat shelter – Rats can and will make any object their temporary or permanent home as long as they can crawl underneath. Until a rat can seek out permanent cover, it will use any flat object lying on the ground including tires, planks, square bales, etc.

Rat proofing – By elevating farm outbuildings, protecting doorways and windows, utility connections and other openings to barns, sheds, granaries, warehouses and industrial structures, rats can be successfully turned away from potential shelter. Efficient rotation of stored grain or forage bales will also discourage rat activity.

Active rat control measures

Use of poisons

The most common and most effective rat baits used today are anti-coagulant baits that cause death in one to three days by painless internal bleeding.

Pre-mixed anti-coagulant rat bait on oats, anti-coagulant blocks and pellets or Liqua-Tox water baits are the most suitable rat baits for Alberta. They are also one of the safest rat baits in use today. Single feeding anti-coagulant rat bait may require several feedings to produce death.

Newer rat baits such as bromadiolone, brodifacoum and difethialone require only a single feeding to kill rats, but

are less safe to non-targets, such as pets and livestock, than single feeding anti-coagulants. The newer baits still require up to three days from consumption to kill rats. For safety reasons, always follow the label instructions when setting out rat bait.

All rat bait must be placed in a tamper-resistant bait station or in a location not accessible to children, pets, livestock and non-targets.

Always use appropriate baits. Use dry bait (block, pellet or grain) where moisture or water is available, and water bait (Liqua-Tox) in extremely dry conditions. Rats can obtain daily moisture requirements from solid foods such as grass, grain, greenfeed and even packed and covered garbage.

First aid and antidote treatment appear on all rat bait containers.

Baiting strategies

Proper placement of rat bait will ensure maximum results.

- Place bait where only rats will find it.
- Place bait in all potential rat habitat.
- Keep fresh bait out at all times.
- Set bait in obvious rat habitat such as bale stacks, under granaries, barns, shelters, silage pits, abandoned buildings, nuisance grounds and garbage facilities.

Rural and farm baiting strategies

Always place rat bait under bales while building the stack. Baits will be easier for rats to find and therefore more effective if placed among the bales. Also, bait does not have to be covered or protected when placed under the bales as the stack goes up. Green feed and straw bales present the highest risks of rat infestation. Hay bales are much less of a threat to attract rats as rats cannot maintain themselves on hay.

However, bait can be placed after the bale stack is completed. Set bait in Tier 1 bait stations (see Figures 9a



Figure 9b. These bait stations are properly labeled as well as locked, and bait cannot be shaken out.

and 9b) or under protective cover such as plywood, sheeting or in clean, empty 20 litre pails with secure lids set on their sides. Cut 6 cm holes in each end. Place bait stations around the outside of the stack at several locations. Label bale stacks properly (Figure 10).

Set out 1 bag of bait for every 10 to 20 large round bales stacked. To discourage rats, leave a 1 metre space between each round bale (do not stack bales on top of each other), and do not keep green feed or straw bales for more than 1 year.

Buildings on skids or poles can be baited by placing bait under the structure between the skids. Bait can also be set between double walls or false floors. To encourage bait consumption, open the bait bag and spill some bait for rats to find quickly.

When baiting silage pits or other fermenting sites, use an all-weather bait such as Contrac Block (bromadiolone) or Ditrac Block. Ramex dry bait may be used; however, care must be taken to ensure the bait does not become moldy or soggy. For best results, place rat bait in properly constructed, Tier 1, bait stations.

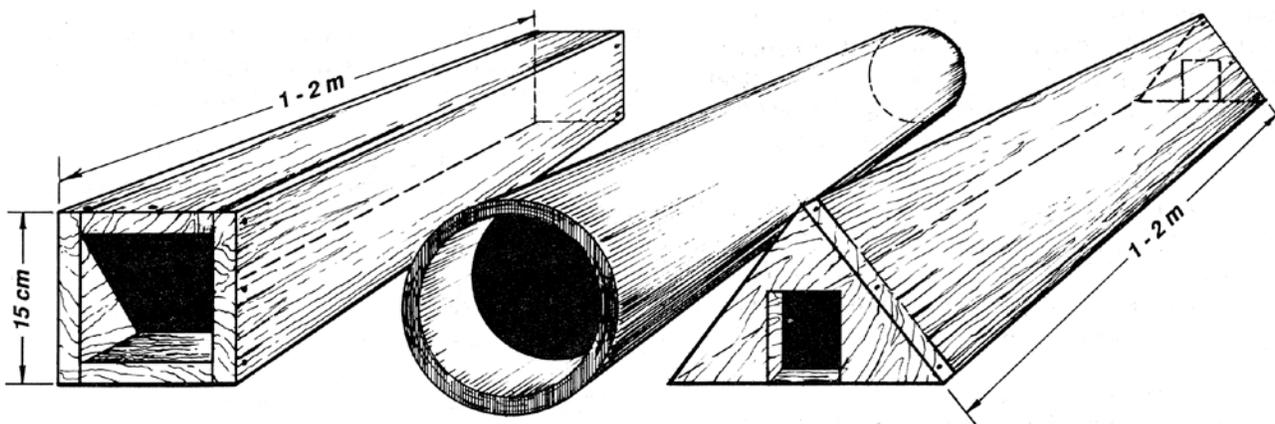


Figure 9a. Bait stations must be labeled, have a baffle in them to prevent bait from being shaken out and must be locked or securely fastened. Unlocked bait stations can be spiked to the ground or screwed to the floor to secure.



Figure 10. Properly labelled bale stacks



Tier 1 bait stations are required to be constructed as follows:

- a. of high strength material resistant to destruction by children
- b. such that a child cannot reach the bait
- c. so the bait cannot be shaken loose
- d. with access locked or securely fastened
- e. with a label of product name, registration number, active ingredient, guarantee, the words “Warning Poison” and a skull and crossbones symbol visible
- f. to resist destruction by non-targets
- g. that non-targets cannot reach the bait
- h. to resist destruction by elements of non-catastrophic weather (snow, rain, sun)

In high-risk areas, particularly where rats have been found before, permanent bait stations should be set out and maintained to prevent recurring infestations. Permanent bait stations should be made of plywood, sheeting or dressed lumber to contain and protect bait while allowing rats direct and unrestricted access to bait.

All outdoor baiting must have bait placed in an approved, properly labeled bait station within 15 metres of a building or 100 metres of a building or (non-food) storage area if the bait station is along a fenceline and anchored down.

During warm, dry weather, prepared water bait should be used wherever possible (Figure 11). Water bait can be presented to rats in several ways, but an effective, easy method to use is the chick waterer.



Figure 11. Water bait station. Stations must be labeled, and the lid must be screwed down or securely fastened. Water bait must be placed indoors.

A discarded tire makes an excellent water bait station. It should be elevated on one side to allow rats easy access to the bait. Always keep water bait stations covered and filled with Liqua-Tox water bait. All water baits must be placed indoors.

When placed in a location accessible to children, pets, livestock or non-targets, water bait stations must have the cover or access securely fastened with screws or locks. All bait stations must be labeled “Warning Poison” with a visible skull and crossbones symbol and have the product name, registration number, active ingredient and guarantee listed (Figure 12).



Figure 12. Bait station labels with the words “Warning Poison” and a visible skull and crossbones symbol as well as the product name, registration number, active ingredient and guarantee required.

Urban baiting strategies

In urban areas, rats may appear anywhere without any apparent source of conveyance. It is therefore important to have all suspect rodent specimens properly identified.

Report all suspect rat sightings to Agriculture and Forestry, Inspection and Investigation Branch by calling 310-RATS (7287), or contact your local or municipal authorities for

further action. All reported rat sightings will be investigated to verify identification, establish control measures and determine the possible source of conveyance.

Rat control action usually takes place within a small area near the suspect sighting. Following lengthy transportation, rats usually arrive in poor physical condition, so they seek the nearest shelter. Swift action by everyone can result in quick and successful eradication, which is why immediate reporting of suspect rat sightings is so important.

Anti-coagulant rat bait works best in urban areas because it is safe to use indoors and outside. All baits have some restrictions. Read label instructions carefully.

Care must be taken in setting out rat bait to prevent non-target poisoning. Follow all label instructions with rat baits, including placing poison warning signs on bait stations and in the bait location.

Always use recommended bait stations, and attach bait bags with a staple or tack inside the bait station. Inform neighbours where rat bait has been set out the same day bait has been set. Pick up and destroy all unused rat bait containers by incineration, and pick up and destroy all dead rats.

For more information, please contact municipal Agricultural Fieldman, by-law enforcement officers or the Department of Agriculture and Forestry, Inspection and Investigation Branch.
Call 310-RATS (7287).

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