Rodents

Pesticide Safety Technical Notes

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Contents

Rodents

Rats and mice are just two of the mammals that belong to the order Rodentia. Over 2200 species of rodents exist with more than 40 percent of all mammal species belonging to the Rodentia order. Australia has over 60 native rodent species and three introduced pest species.

Rodents have successfully populated every continent (except Antarctica) because of their small size, short breeding cycle and ability to consume a variety of foods. They are the second most successful mammal on the planet, coming second only to humans.

Rodents consume and destroy their food source during feeding. This can cause devastating damage to a wide range of settings such as domestic households, commercial businesses, farms, manufactures and livestock to name a few. Not only do rodents gnaw through many materials, but they can also ruin food supplies by excreting waste on them.

Not all rodents are considered pests, rodents are an important part of the food chain; being prey for meat eating animals such as cats, snakes, large birds or foxes. Rodents are also important ecologically for spreading seeds and spores.

Rodents are characterised as having two sharp, continuously growing teeth in the upper and lower jaws. The rodent's teeth are used continually to gnaw their food sources, thus controlling the growth of their teeth.

Major pest species

Norway rat

The Norway rat (*Rattus norvegicus)*, also known as the common rat, sewer rat or brown rat, is the larger of the pest rats. Their life span is usually between 9-12 months. Females can have 5-6 litters per year, averaging 8-10 pups per litter. The gestation period is 21 days and the young reach sexual maturity at 3-4 months.

Norway rats are usually active at night and are good swimmers. They dig well and are able to communicate through high pitched vocalisation.

The Norway rat is an omnivore and will eat food from both plants and animal origin. They will eat almost anything, although they prefer starch and protein rich food such as cereals, which form a substantial part of their diet. Other foods they eat include meat, fish, vegetables, weeds, earthworms, crustaceans, nuts and fruit.

Norway rat physical appearance:

- brown or grey in colour with grey belly fur
- length of head and body between 20-27 centimeters
- length of tail between 16-20 centimetres
- large build
- weight between 200–500 grams
- blunt nose
- short thick ears with fine hair
- grey feet
- banana or sausage shaped droppings.

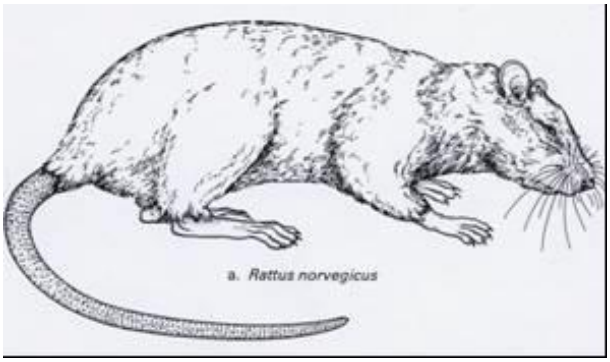

Figure 1. Norway rat

Roof rat

The Roof rat (*Rattus rattus)*, also known as the ship rat or black rat, is smaller than the common Norway rat. Their life span is usually between 9-12 months. Females can have 4-5 liters per year averaging 6-8 pups per litter. Females have a gestation period of 3 weeks and sexual maturity is reached at 3-4 months.

Roof rats are usually found in built up urban areas or near the coast. They have good climbing ability and can nest in buildings, roof voids and marine vessels.

They eat a wide variety of food items generally feeding on cereals, grains, fruit; almost any item that has nutritional value. They are omnivores and will feed on insects or meat if necessary.

Roof rat physical appearance:

- grey, black or brown in colour with occasional white belly fur
- length of head and body between 14-20 centimeters
- length of tail 25 centimeters

- small, slender, streamlined build
- weight between 200-300 grams
- pointed nose
- large, thin, almost hairless, translucent ears
- pink feet
- ellipsoid or spindle shaped droppings.

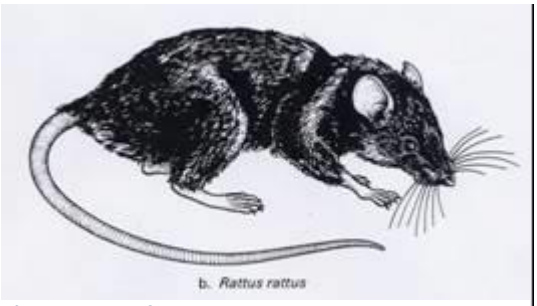

Figure 2. Roof rat

House mouse

The house mouse (mus domesticus) is small. It has a life span of approximately 12 months. Females can have 6-10 liters per year. The female gestational period is 3 weeks and sexual maturity is reached at about 6 weeks.

House mice are curious animals and can live indoors or outdoors within close proximity to humans. They have a wide and varied diet including fruits, nuts, grains, animal feed and cereals.

House mouse physical appearance:

- brown or grey in colour
- length of head and body between 8-10 centimeters
- length of tail between 8-10 centimeters
- weight between 14-20 grams
- small slender build
- pointed nose
- large, hairy ears
- pink feet
- small spindle or irregular shaped droppings.

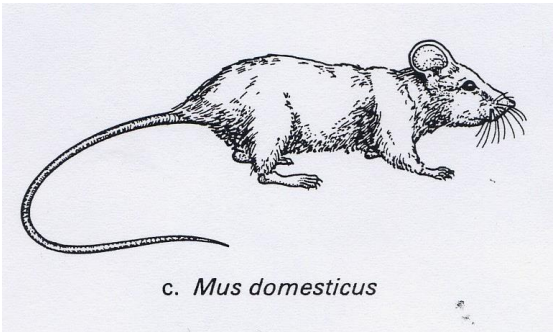

Figure 3. House mouse

Identifying rodent infestation

Inspect the premises carefully and look out for signs of damage caused by gnawing or feeding, holes, smears and droppings. Mice tend to feed by nibbling: eating the outside of grains and leaving the core. However, rats will often leave crumbs or smaller pieces of food.

House mice tend to live inside the building and will gnaw holes up to 20 millimetres in diameter in walls, partitions and floors. Holes made by rats will be larger, approximately 80 millimetres in diameter, and may be the entrance to nests. Nests may be found in hidden areas and can be made up of a wide range of materials such as cardboard, paper, straw and rags.

Rodent control methods

Sanitation and exclusion

When looking at ways to prevent and control a rodent problem, always assess the area for possible sources of food, water and shelter. Good levels of hygiene and removal of clutter, excess foliage in the garden, plumbing leaks, food scraps, nesting sites or shelter are all good ways to discourage rodents from inhabiting an area.

Mice are able to squeeze into gaps as small as 8 millimetres, so ensure even small gaps or holes are filled.

Trapping

Physical traps include glue traps, simple snap traps or more complicated multiple-mouse catching devices. Trapping methods require more time and labour than the other chemical methods of rodent control. Therefore, this method is less cost effective and used less frequently by pest control operators. Glue traps can only be used by licensed pest control operators in commercial food manufacturing premises, in accordance with the Prevention of Cruelty to Animals Regulations 2008.

Situations where trapping of rodents may be the most viable option include:

- instances where chemical pesticides are not accepted such as commercial food manufacturing premises
- capture of individual rodents that are not consuming bait

Rodenticides

Rat and mice infestations are commonly controlled using rodenticides. Rodenticides can kill the rodent with a single dose (acute) or through multiple doses (chronic).

Acute rodenticides include:

- Metal phosphides (Zinc*, Aluminium, Magnesium and Calcium)
- Norbormide
- Broadifacoum
- Flocoumafen
- Difenacoum

Metal Phosphides are usually fumigants and are fast acting, single dose rodenticides. Once baits containing Zinc phosphide are ingested by the target animal, the pesticide reacts with stomach acid in the digestive system to produce a toxic phosphide gas.

Norbormide is only effective against the common rat. It acts by disrupting the blood supply to vital organs by constricting blood vessels.

Broadifacoum, Flocoumafen and Difenacoum are all highly lethal anticoagulant poisons. Anticoagulants stop blood from clotting causing it to become thin. This results in the rodents dying of internal haemorrhage.

Chronic rodenticides include:

- Warfarin
- Coumatetralyl
- Diphacinone
- Calciferol

Warfarin, Coumatetralyl and Diphacinone are anticoagulants. Calciferol is a form of vitamin D used in combination with anticoagulants to improve their rodenticidal effects.

Safety Precautions

- Read the product label and safety data sheets prior to use and only apply pesticides in accordance with the label directions including any safety information
- Wear appropriate personal protective equipment (PPE) when handling pesticides
- Do not place baits in areas where they can be accessed by children, pets, wildlife or livestock, or use lockable bait stations

- Place baits only in locations from which they can later be retrieved
- Keep a record of bait placements
- Inspect bait stations regularly and remove baits if the rodent problem ceases, ensuring appropriate disposal
- Notify all occupants of the building about the use of pesticides
- Do not place baits or tracking powder where they can cause contamination of food or food handling areas
- Do not eat, drink or smoke when handling pesticides
- Always wash PPE such as gloves, clothes and boots after pesticide use
- Store pesticides in their original containers and ensure that the label remains intact. Do not transfer products to alternative containers.

To receive this document in another format, email Pesticide Safety <pesticidesafety@health.vic.gov.au>.

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