

# I smell a rat!

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**Q1**

**Q2**

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look into it the more you are likely to find.

John Murphy, an exterminator, in *Pest Control Technology* magazine

**Q3**

Visit any high-street DIY store and you will see an impressive range of vermin repellent products (Figure 1) giving you an indication of a booming market and problem every building surveyor and property manager needs to be acutely aware of.

## ABSTRACT

*As rat numbers increase alongside a decrease in local authority pest control budgets, it is essential that surveyors and property managers alike can identify and prevent rat infestation. If left unchecked, rats can cause significant damage to a property and in some instances be the cause of serious fires, as well as being a serious risk to health and safety. This paper will explain how to spot the tell-tale signs of a rat problem within the broader context of a rat's habitat and behaviour, and go on to give recommendations regarding deterrent and prevention measures from good housekeeping and building management through to trapping and poison options.*

**Keywords:** building surveyor, rats, identification, prevention

## WHAT IS THE PROBLEM?

*Rattus norvegicus*, aka the Norway or brown rat. Rat numbers are on the increase as human population densities increase, warmer and wetter weather prevails and our nation's increasingly slovenly refuse habits provide a constant food source. The presence of rats in types of property from residential through to commercial can lead to very serious problems. Property owners and advisers need to be informed of these risks and given the appropriate recommendation for resolution from their property and construction advisers.

## Biology, life cycle and habits

Rats are active mostly at night. Although they have poor vision they have highly-developed senses of smell, hearing and touch. Rats can eat a third of their weight in food a day. Unlike other rodents, rats have a strong need for water — 1/2 to 1 ounce a day. They eat many types of food from cereal to grains, meats, fish, nuts, and

## INTRODUCTION

You always have to think beyond the structure. Think about what is going on underneath and all around, because that is where the rats are located. The more you



Figure 1 A wide range of vermin repellent products

rarely travel more than 50m from their burrows or nests.

Rats are inquisitive animals and love to explore and learn, memorising the locations of pathways, obstacles, food and water, shelter, and features of their environment.

Rats can gain entry into buildings by climbing, jumping or swimming, and especially through sewers and entering through toilets or broken drains. Young rats can squeeze beneath a door with only a 13mm gap

The life expectancy of a rat is approximately ten months. Litters of two to three young are born 21 to 23 days after conception. Young rats (although they have a low survival rate) are completely independent at about four weeks and reach reproductive maturity at three months of age. A typical female rat can produce a litter about six times a year and successfully wean 20–30 young per year.

### **STRUCTURAL AND COSMETIC DAMAGE**

The term ‘rodent’ means gnawing animal. Rats have very hard front teeth that never stop growing, and with their genetic compulsion to gnaw will cause damage to the fabric of any building they occupy.

This ranges from minor holes in walls, doors, furniture, cupboards through to



Figure 2

**Q4**  
**Q5**

structural collapse, flooding, electrical faults and fire (caused by gnawing through cables).

The author has witnessed 3-core insulated lighting cable in suspended ceilings gnawed through to the exposed copper. There is some anecdotal evidence to suggest that rats like the slight warmth given off by conductor cables from the current flowing through it.

It is estimated that 7 per cent of house fires are caused by rats; yet very often, traditional buildings insurance does not cover damage caused by vermin.

### **DISEASE**

Rats carry the potentially fatal Weils disease, which is a bacterium carried in the rat's urine. Rat's urine often has a powerful ammonia smell, which is a distinctive sign of a vermin problem for the building surveyor.

Rats will stay at a property for three key reasons: food and water supply and shelter.

## THINGS TO LOOK OUT FOR

Rat droppings are on average 12mm and spindle-shaped. House mouse droppings are much smaller, 3–7mm in length. Other signs of the presence of rats include:

- *Indoor smears*: grease marks from the rodent's body as they repeatedly brush up against objects;
- *Nesting material*: shredded insulation, paper, cardboard, plastics, etc;
- digging scratching and burrowing marks.

Blocked and sunken drains provide an excellent food source for the remarkably unfussy rat — consider how much fat and left-over food is flushed through our drainage system each day. One should be particularly wary of drains running directly under properties.

Similarly, leaking water pipes provide the fresh drinking water rats have a high demand for.

Unsealed penetrations into the property, such as holes into suspended floors and cavities provide a perfect route for rats to enter and nest within a property.

Rats are incredibly resourceful and will eat pet food and feed from bird tables. They will burrow into compost bins, climb into dustbins (particularly as local authority refuse collections decrease in frequency) and unsealed household recycling bins, and generally feed on all edible street litter from take-away food restaurants etc (Figure 3).

## CONTROL MEASURES

Despite the booming market in vermin deterrent products for sale on the high street, in most instances control should only be undertaken by professionals trained in the handling of poisons and dangerous and powerful rat traps, which can cause very serious harm and or death to other animals and persons.

Rats are highly skilled at detecting and thus tend to avoid new objects and novel foods. This neophobia is highly pronounced



Figure 3

in the Norway rat found in the UK and thus, they often avoid traps and baits set by the novice. Any bait or traps that have come into contact with humans (by handling) will be immediately detected by a rat and very often completely ignored.

Rats are certainly smart enough to avoid going anywhere near a trap that has been activated but has failed to trap them the first time. To avoid 'trap shyness', many pest-control companies will lay baited traps that have *not* been activated for a week or two to enable the rats to become familiar with the trap. Very often, it can take a month for a trap to be activated.

The placing of rat traps is just as important as the type of trap or bait and there is a myriad of factors to be considered by the professional pest controller, and very often overlooked by the novice using DIY traps. The rat's nature is to stick to preferred routes and close to the cover and protection of walls.

The most successful trap is the old fashioned 'sprung/snap' rat trap. The recent proliferation of high street deterrents such as glue traps, sonic repellents etc are likely to be less effective than snap traps and are generally aimed at giving the general public some relatively safe options with varying degrees of success before more professional options are considered.

An alternative approach to traps is the use of poisons. These range from fast-acting

highly-toxic poisons to more slow-acting (anti coagulant) poisons delivered over a number of days.

The rats' adaptability to change (Figure 4) though is highlighted by their response to Warfarin used as a rat poison. Its use is now declining, because many rat populations have developed resistance to it, and poisons of considerably greater potency are now available.

These poisons can be used locally for specific rat problems or placed over wider areas (usually by the local authority or water sewage company) through baiting local sewers on a commercial scale.

The HSE offer some useful guidance on the law and best practise for professionals:

Active ingredients are divided into three main groups, reflecting the way they work. Acute rodenticides act rapidly (within 24 hours), but may induce bait shyness if a sub-lethal dose is eaten. Sub-acute rodenticides may not cause death for several days, even though a lethal dose may be consumed during the first 24 hours and feeding may continue during this period. Chronic rodenticides are slow-acting and the anticoagulants belong to this group. They can cause death in a minimum of 2–3 days, but on average it takes 5–7 days.

Anticoagulants can be sub-divided into first- and second-generation anticoagulants,



*Figure 4 Brown rat — rats are now able to resist the effects of popular poisons such as Warfarin (Photo © iStockphoto/Andrew Howe)*

based on their potency, or into single-feed and multi-feed anticoagulants, depending on the number of feeds required. Your choice of active ingredient will be determined by the characteristics of the site, previous treatment history (if available) and the conditions of use on the product label. The choice of product will influence operational aspects of the treatment regime.<sup>1</sup>

The variety of poisons available is large and use is best left to the specialists.

Many poisons, eg Phostoxin gas pellets, cannot be bought over the counter and must be used by a trained technician. These products contain aluminium phosphate, which turns into phosphine gas when it comes into contact with moisture and air.

Such is the misuse of poison by the general public that previously popular poisons (eg Lindane powder) are now prohibited, because the harm and damage to non-target species has been unacceptably high and is now classified by the World Health Organization as moderately hazardous.

Baits are also sold in water-soluble form, and work best for rat control where water has been available but is unavailable at the time of poisoning.

Poison formulation and placing will depend on many other factors, such as the risk of ingestion by other animals or wildlife, or the type of building and location of the vermin outbreak.

In 2000, Water UK proposed a London Sewer Rat Baiting and Treatment protocol, providing a mechanism for improved communication and coordination between local authorities and sewage undertakers on the control of rats. The protocol called for cooperation on rodent control and for sewer baiting and surface treatments to be undertaken in a complementary manner, and in agreement with all relevant agencies.

The National Rodent Survey 2009/2010, carried out by the National Pest Technicians Association in half the country's local authorities confirms some important and

worrying findings and trends in relation to this protocol, and particularly in relation to the current austerity cuts:

The overwhelming majority of local authorities always used to provide rodent control free of charge as part of their core public health responsibilities. Our latest survey shows that over 60 per cent are now charging for at least some of their rat control services and nearly three quarters for house mouse treatments.

In parallel to the decline in local authority treatments, our members report a particularly worrying increase in DIY rodent control by householders and businesses. In many cases, poorly managed amateur practice is resulting in growing rat and mouse problems.

If anything, though, we are even more concerned about the impact public sector cutbacks will be having on the central role local authorities have long played in pest control training and practice development. The full implications of this are unlikely to become evident for eight to 10 years — by which time it will be far too late to take any corrective action.<sup>2</sup>

The most successful deterrent is exclusion:

- Sealing all obvious holes, gaps and openings within a property. This includes all holes greater than 5mm in diameter and, because rats are excellent climbers, for the full height of the elevation of a building, especially at the roof line.

- Wire wool is useful for plugging many holes to deter rats and prevent gnawing.
- Remove vegetation growth that can attach directly to the house such as climbing ivy or tree branches.
- Place rat guards on pipes and gutters leading up to the house.
- Place sturdy screens around vents and openings. The mesh size should measure no more than 5mm.
- Repair gaps in sewer lines and other pipes leading to the house.
- Place sturdy coverings on drain holes.

Rats show the following characteristics: intelligence, ingenuity, aggressiveness, and adaptability. In many ways they mirror the building occupants they live with!

#### REFERENCES

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#### FURTHER READING

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