



Urban rodent control and the safe use of rodenticides by professional users

HSE Information Sheet MISC515

Introduction

This information sheet is aimed at people working in rodent control in urban areas. It gives guidance on the precautions you need to consider when carrying out treatments to control the two main urban pest species, brown rats (*Rattus norvegicus*) and house mice (*Mus domesticus*). It assumes that you are competent and have been adequately trained.

Rodents pose a threat to people's health and may cause significant damage to commodities and the fabric of buildings. The primary aim is to avoid infestation, as once established, rats and mice can be difficult to control.

You may have to deal with infestations inside and outside buildings and there may be populations of rats in the sewer system. It is important to review approaches to control holistically and integrate a range of control measures into your treatment strategy. Relying on rodenticides alone does not guarantee that the infestation will always be eradicated and numbers may quickly recover after treatment. It is important that following measures to reduce rodent numbers you consider ways of improving environmental management at the site. This should provide effective, long-term control of rodent infestations. You should concentrate particularly on improving hygiene and proofing, maintenance and repair of buildings.

If your assessment confirms that rodenticides are necessary, it is important to use them safely. This information sheet contains advice on how to minimise the risks rodenticides may pose to human health, non-target animals and the environment.

What to do before treatment

Client details

When you receive notification of an infestation, take some basic information including:

- details of the person reporting it;
- where rodents have been seen (indoors/outdoors); and
- if indoors, a suitable time to gain access.

In commercial premises, it is useful to establish who to report to on site and if there are parts of the site where pest control technicians may have restricted/no access.

If you have treated this site before, it is good practice to review the previous strategies, advice and potential problems associated with the site before visiting. It is important to involve your client when discussing the range

of strategies you intend to adopt. If your previous advice has not been followed, then this will need to be revisited, underlining the importance of environmental management in the successful control of rodent populations. It is also important to explain to the client that you will need regular access to the site during the treatment phase and at the end to remove bait that has not been eaten. Convenient times for revisits should be agreed.

Site survey

You should carry out a site survey to establish the type, level and extent of the infestation. The survey will help you to identify important factors (eg the degree of public access to the site; the presence of children and non-target animals, such as pets and wildlife) that will influence your choice of control strategies for that site. Evidence of poor housekeeping and hygiene, alternative sources of food and obvious building/drain defects should be noted on the site plan. It may be useful to obtain photographic evidence of poor environmental management practices.

During the survey, try to establish the rodents' food sources. This will be particularly important if you intend to use concentrates to formulate your own baits, as part of the treatment strategy. Reducing the availability of alternative food at the start of a treatment, or shortly afterwards, can encourage rodents to feed on your bait. Where there are rats you should note obvious drainage defects, such as broken pipes, defective chamber covers, bad brickwork, half channels inside manholes, stoppers missing from the rodding eye or surface water gullies and bring them to the attention of your client.

Where there is an obvious defect that may allow rat invasion from neighbouring properties, it is good practice to tell your client of the risk this may pose and where appropriate report it to the local authority, who may be able to initiate a repair.

Block treatments

Effective control of rodents in the urban environment may be difficult in buildings with multiple uses and/or occupiers. There may be several agencies involved in controlling rodents. Where possible it is good practice to co-ordinate control measures to make sure all premises on that site are inspected and, where necessary, treated. This will reduce the chances of rodents surviving the treatment by avoiding the control measures and reinvading the areas you have treated.

Risk assessments

The information gathered during the survey should enable you to identify the hazards on the site and determine the

risks posed to:

- human health (eg through accidentally eating bait, particularly by children);
- non-target animals (eg through eating bait and/or poisoned rodents by pets and/or wildlife);
- the environment (eg through contamination of watercourses).

This risk assessment will determine the treatment strategy you adopt. After considering control measures such as proofing, improvements in hygiene, environmental management, and non-chemical approaches to control (eg traps) you may conclude you still need to use a rodenticide. Before carrying out any work you should carry out an assessment, as required by the Control of Substances Hazardous to Health Regulations 2002 ('the COSHH assessment'). This will help to make sure the product you select and its method of application will effectively control rodents, while minimising risks to yourself and anyone else who comes into contact with the rodenticide. At this stage, you should decide where to lay bait points and, if appropriate, how to prevent access by children and non-target animals, eg by:

- locating baits in inaccessible positions;
- directly baiting outdoor rat holes;
- using materials available on site to protect bait points;
- placing baits in locked or otherwise secure premises;
- using self-made bait boxes which are fit for purpose;
- using proprietary tamper-resistant bait stations.

COSHH and the Management of Health and Safety at Work Regulations 1999 require that assessments are carried out to identify any risks to operators and others who may be affected by the treatment. There is a requirement to record the findings of the assessment, unless they are so simple that they can be easily recalled and the conclusions explained at any time. However, small companies with fewer than five employees are not required to keep a written record, although it is good practice to do so.

Bait formulation

The bait formulation should be appropriate to the conditions and circumstances of the infestation. A wide range of ready-to-use products are approved under the Control of Pesticides Regulations 1986 (as amended 1997)/Biocidal Products Regulations 2001 (as amended 2003) for use as rodenticides, formulated on a variety of bait bases.

Rodenticide concentrates for preparing dry or liquid baits are also available. You should use a bait base that is suitable for the infestation, such as the primary food the rodents are eating. If you decide to use a concentrate, you must justify its use within your risk assessment. If you prepare and mix your own bait, you may need to take additional precautions, including the use of personal protective equipment as identified by your COSHH assessment. It is illegal to exceed the recommended

concentration. Doing so will mean the finished bait poses a greater risk and is likely to make it less palatable to the rodents. It is also illegal to add substances such as flavour enhancers to ready-to-use products to try to improve their palatability.

You must check the approval conditions granted for each product you intend to use.

Active ingredients

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, 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.

Remember:

- **only use a product that has been approved under the Control of Pesticides Regulations 1986 (as amended 1997)/Biocidal Products Regulations 2001 (as amended 2003) for use as a rodenticide;**
- **comply with the statutory conditions of use, which are given on the product label;**
- **follow directions for use and any other information supplied with the product;**
- **make sure you carry out all the control measures identified in your own COSHH assessment.**

Failure to do this may result in action by the enforcement authorities.

Guidance for treatment

Restricting access to foodstuffs is an essential precursor to treatment.

Use a variety of control methods

The urban environment is a diverse and complex setting, with different types and ages of properties with different uses. It is important that you do not rely solely on the use of rodenticides to control urban rodents. Programmes that integrate a range of methods, including physical and/or biological control, will be more successful in the long term than those that rely solely on chemical means.

While trapping is labour-intensive, it can prove useful in controlling small infestations and may provide an alternative means of control where the use of rodenticides is unacceptable. Break-back traps for use against mice and rats are available. If you intend to use live-traps, they should be inspected regularly, at least once a day, and any captured animals humanely dispatched. Although the use of rodent boards are still permitted, this method does raise concerns about humaneness. You should consider all other options before adopting this method of control and clearly justify its use for each treatment. When using rodent boards, the frequency of inspection and dispatch of captured animals follows that specified for other live-trap methods.

Once adequate control has been achieved the following environmental management measures should be considered:

- improving hygiene by clearing away rubbish;
- reducing harbourage;
- proofing buildings.

Areas that are prone to infestation and reinfestation should be monitored regularly to prevent chronic infestations becoming established. Where you suspect fly-tipping or accumulations of rubbish may be contributing to the persistence of an infestation, the local authority environmental health department may be able to help remove such accumulations.

Rodent behaviour

Rats are particularly shy animals and nervous of strange objects that appear in their territories. It may be better to protect and secure bait points using existing materials, rather than introduce bait containers. During the survey, note any general features (such as gaps underneath paving flags) that you could use to place bait safely. This may eliminate the need for bait boxes and be more effective in bringing the rodent into contact with the bait. It may also reduce the total length of time bait needs to be laid and therefore reduce the likelihood of non-target animals coming across it.

House mice are generally more inquisitive, and so are less likely to avoid new objects in their environment. As a general rule, mouse control is more likely to be successful if small amounts of bait are placed at a large number of locations.

Hoarding of bait

Remember that rats may carry bait away and hoard it, or drop it in areas where children or non-target animals can come into contact with it. If more bait is being consumed than expected for the size of the infestation, consider whether hoarding may be a problem. If you think it is, search for any caches of bait and dispose of it safely. You should secure any place packs/sachets or blocks at the placement site or reconsider the bait formulation being used. It will be more difficult for rats to hoard large quantities of loose grain bait and the quantity of

rodenticide in single pellets or grains will be substantially less than that in intact place packs/sachets or blocks, reducing the potential risk to non-targets if bait is dropped by rodents.

Placing the bait

Outside occupied buildings you may find rats in burrows; piles of rubbish; vegetation or other materials; sheds and garages or other buildings; compost heaps/bins and drains.

In all these situations you must make sure bait is adequately protected from children and non-target animals. If you place the bait in rat burrows, cover the burrow entrances afterwards to reduce the risks of bait being ejected or spilt.

If you place bait inside, directly on the floor, it may be difficult to remove at the end of the treatment. Use of plastic trays or other measures should help to avoid this. You also need to take account of the risks from bait being disturbed as a result of activities of rodents or other animals or changes to the site as a result of, eg building work. You should consider the size and the likely reactions of the rodent population (ie identify areas where rats may feel uncomfortable).

If you cannot find suitable cover to protect baits, you will have to use other measures unless (for indoor baiting) you can control or restrict access to the area where the bait is laid. You can make your own boxes for this, as long as they are fit for this purpose, or you can buy commercially available tamper-resistant bait stations. Where your COSHH assessment identifies it as necessary, you should ensure the bait station is secured in position (eg when the bait is of a type that could be shaken out), and that you have followed the instructions to prevent the container being opened.

Rodenticides may cause rodents to die in inaccessible areas, where it will be difficult to retrieve the dead bodies. This could cause problems with odours and in such locations it may be appropriate to consider alternative control methods, such as the use of traps, to help retrieve the dead bodies.

Monitoring

Once the treatment phase is underway, it is important to monitor it regularly to track its progress. During revisits you should:

- search for and remove any carcasses;
- make sure there is enough bait available;
- check that the baiting points remain secure;
- deal with spillages or other problems as they occur; and
- observe progress of the treatment.

Effective monitoring needs a reliable recording system and should enable you to identify potential problems with progress, such as a decline in efficacy of a particular rodenticide. This should prompt a review of your strategy.

Records

Record where you have placed the bait, which rodenticide you used and how much bait has been laid. For complex and/or large sites, ask the client to provide a site map, if there is one, for you to record the positions where bait has been placed. Tell the person you are dealing with and others with regular access to the site what you have done, where any rodenticide baits are, the products used and the risks associated with their use, what to do in an emergency and your contact details if they need further advice about the treatment. Leave a copy of your written record and a sketch plan of the bait points with them. If possible, obtain their signature to confirm that they have received and understood details of the work that has been carried out.

There may be instances where a treatment is carried out at a site where English is not the first language of your client. So, it may be difficult to ensure that the details of the treatment have been understood. Take reasonable steps to make sure that the hazards and risks associated with the treatment have been understood.

Removal of dead rodents

Search for and remove any dead rodents and dispose of them safely, in line with the product label. This is particularly important to reduce the risk of secondary poisoning, especially in areas where birds of prey or other predators are known to be active, and where large populations of outdoor rodents are being controlled. For further advice on the disposal of rodent bodies contact the EA/SEPA.

Replenishing bait

Once laid, baits should be inspected frequently and where bait has been eaten, it should be replenished as necessary. Determine how often you need to inspect baits from the label instructions and the characteristics of the infestation. It is important to record the amount of bait put down, so you can decide whether larger amounts are needed. Continue baiting until all feeding activity has stopped, as overcoming the neophobic response in rats may take some time. However, if there is little evidence of bait takes after two weeks, it is unlikely that the treatment will prove effective and you should remove the bait and consider an alternative strategy.

Resistance

Resistance to anticoagulants has been confirmed in some rat populations in agricultural areas, although the position in urban environments is unknown. Treatment failures are more likely to be due to inappropriate bait, inadequate quantities of bait, poor bait placement, bait shyness or re-invasion from surrounding areas. But, if these factors have been ruled out and the bait is still being eaten without any obvious decline in the rate of consumption, it may be a sign of the presence of true anticoagulant resistance. Anticoagulant resistance in mouse populations is so widespread, that no first-generation anticoagulants are

approved for use against them. Behavioural resistance in mice has also been reported and if you suspect that you are dealing with such a population, you will need to consider alternative treatment regimes/control methods (eg placing bait directly on the floor rather than in bait boxes), alternative formulations (eg contact dusts or gels) or alternative bait bases (eg using the foodstuffs they are eating at the site).

If you have ruled out all other possible explanations for the persistence of rodent populations in urban areas and suspect that you may be dealing with a resistant population, you should inform RRAG (the Rodenticide Resistance Action Group: RRAG, 1 Gleneagles House, Vernongate, South Street, Derby DE1 1UP Website: www.bpca.org.uk/RRAG/about.htm). This information could identify potential hotspots of resistance in urban areas and will complement the information that already exists for agricultural locations.

Using non-anticoagulant rodenticides

While anticoagulants provide an effective and efficient method of controlling rodents, if they are not available, if they cannot be used or if resistance to them has been confirmed, you may need to consider alternatives such as calciferol (approved for use against rats and mice) or alphachoralose (only approved for use against mice).

Reinvasion

In urban areas, the risks of reinvasion from neighbouring sites may be considerable, especially in areas where general environmental management is poor. It is good practice to liaise with other pest control contractors, regulatory agencies and the general public to coordinate control strategies and reduce the risk of reinvasion. Where members of the public wish to feed wild birds, they should be encouraged to use RSPB-approved bird feeders and be made aware that throwing bread and other food on the ground may, in addition to feeding the wild bird population, provide a food source for rats in the area. General advice on the storage of refuse and the use of rodent-proof bins should be provided where appropriate.

Long-term baiting

Long-term and perimeter baiting may help to control invading rodents, or give you early warning of an infestation, so treatment can be better targeted and timed, ie before an infestation becomes well established. However, consider these approaches carefully and be justified in your risk assessment for each location where they are used. The preferred approach is to use non-toxic blocks or whole grain as a guide to the presence of an infestation that may then trigger the use of a rodenticide. Check baits regularly to establish whether rodents are present.

Bait stations should be established on likely runs by vulnerable buildings and premises. Where possible, these should be camouflaged. As well as being secure, the bait should be protected from the effects of moisture. Baits

based on whole grain, pellets and wax blocks are usually the most suitable for this purpose. Wax blocks and sachets should, where necessary, be secured inside bait stations.

Retrieval of bait

After you have finished the treatment, you must make sure all traces of bait have been removed from the site and disposed of according to the label instructions. You cannot rely on others to carry out these tasks. If you are denied access to the premises to do this, it is good practice to record when you attempted to retrieve the bait and to explain to the client in writing that responsibility for disposal has now been transferred to them. You may wish to leave details of the requirements for disposal of the rodenticide(s) that have been used. If a previous contractor has not removed the bait they laid, you should give them the opportunity to do so. If they do not do this in the time frame specified, they will have no further claim on it, but you will have a duty of care to dispose of this rodenticide safely. Rodenticide that you have retrieved from a treatment you have undertaken may be reused if it is clear that it has not been contaminated or marked by the rodents, providing it can be stored in line with the approval conditions of the product.

Storage of bait

Keep all rodenticides secure in a suitable store. You should keep bait in its original packaging, except when put into a new container for use, when a current copy of the product label should be attached. It is illegal to offer such relabelled bait for sale, or supply it to others. Equipment used during treatments should be cleaned after use. Where bait is prepared from a concentrate, ensure it is labelled with the bait label supplied.

Rodent-borne diseases

Rodents carry diseases that may be serious or even life-threatening to people. These may be caught by contact with surfaces or water contaminated with rodent urine. You should wear waterproof gloves when working in areas that may be infested. Cover cuts and abrasions on exposed parts of the body with waterproof dressings. Wash exposed skin thoroughly before eating, drinking or smoking and after completing work. If you cut yourself, clean and dress the wound immediately. If you regularly work in rodent-infested areas, your employer should provide you with the HSE pocket card, *Leptospirosis: Are you at risk?*. Alternatively, you may obtain one from HSE Books (see 'Further reading').

Urban situations

Domestic premises

Dealing with rodent infestations in and around domestic premises poses particular problems with placement and protection of bait. It is important to explain to the householder the risks associated with the use of rodenticides. Once baits have been laid, make sure the

householder knows their location and is aware that they must not be moved or disturbed. Children and non-target animals, such as pets, may not be present at the time of your survey and/or treatment, but may be there at other times. If this is the case, it is important to place baits in such a way to prevent contact. If adults with learning difficulties are present, you must ensure that a responsible person has been informed of the treatment regime and the risks associated with the use of rodenticides. It is good practice to leave written details about the products you have used and the actions needed if bait is consumed accidentally.

Unprotected stores of pet food may attract rodents and householders with pets should be advised to store such food in sealed containers. Poorly constructed compost heaps and compost bins placed directly onto soil may provide harbourage for rats and should be inspected during your survey. To discourage such infestations, give householders advice on their construction (placing them on a hard flat surface such as concrete or stone paving flags) and measures to exclude rats (eg by surrounding the base with fine chicken netting). General advice on the importance of sound structural maintenance of the property (eg sealing gaps under doors and around service pipes) should be given where appropriate.

Commercial (non-food) premises

The risk of infestation within commercial, non-food premises will be influenced by the work that takes place in them. A thorough survey should establish the areas that may be prone to infestation. Where catering facilities are on-site this may be an important area to examine in detail.

Commercial (food) premises

Under food safety legislation, owners of food premises must periodically visually check for signs of pests and have a pest control reporting system in place. This should provide you with information on any recent sightings and may provide details of previous treatments. Where you are concerned about general standards of hygiene, you may wish to discuss this with the local authority environmental health department's food enforcement staff.

Large institutions (eg hospitals, prisons etc)

Large institutions may have several locations that are prone to infestation. The presence of vulnerable individuals and restricted or limited access to particular areas will need to be considered when deciding on your control strategy. On-site kitchens may be an important focus of rodent activity. If waste disposal systems for food discharge directly into the drainage/sewer system, this could act as a rich source of food for rodents. So it is essential that you do a thorough site survey and the methods and routes for disposing of food waste are established. Rodents may also invade other parts of the building when food is transported from the kitchen to where it is eaten. Service ducts may provide a route for the rapid spread of rodents through the complex and should be examined for evidence of rodent activity. If the

ducting is classified as a confined space, then those undertaking inspections and treatments must be adequately trained to work in confined spaces.

Access restrictions to particular areas of the site may mean that it is not feasible to place rodenticide baits in all parts. Integrating a range of control methods, combined with close monitoring of the progress of the control programme, is essential in such locations.

Parks and gardens

Dealing with rodent problems in open urban situations creates particular problems regarding the protection of bait points, particularly where rats may be associated with lakes and ponds. Place baits directly into active burrows, especially in areas where the public have restricted access, such as islands on a lake. Loose grain and pelleted formulations may be suitable for such purposes. Cover all treated holes, and regularly monitor for evidence of bait consumption, spillage or disturbance.

Sewers

Urban sewers provide an ideal environment for rats. A protocol agreed between the Local Government Association (LGA) and Water UK, in liaison between local authorities and water companies in England and Wales, was issued in December 1999 and should ensure better coordination of public sewer control. This is available at: www.water.org.uk/index.php?raw=88.

If you are concerned about drainage defects contributing to infestations, you should report these to the local authority, who can liaise with the appropriate water authority or can serve a notice on the private sewer owners.

Further advice

You can get further advice on dealing with rodent infestations from rodenticide manufacturers and distributors, the British Pest Control Association (BPCA) (Tel: 01332 294288; Website: www.bpca.org.uk); the National Pest Technicians Association (NPTA) (Tel: 01949 81133; Website: www.npta.org.uk); the Chartered Institute of Environmental Health (CIEH) (Tel: 020 7928 6006; Website: www.cieh.org.uk), the Environment Agency (Tel: 08708 506506; Website: www.environment-agency.gov.uk); English Nature (Tel: 01733 455000; Website: www.english-nature.org.uk) and the Department for Environment, Food and Rural Affairs (DEFRA) (Tel: 08459 335577; Website: www.defra.gov.uk). For guidance on the legislation, consult the Health and Safety Executive (HSE) Infoline: 08701 545500; Website: www.hse.gov.uk).

Further reading

The safe use of pesticides for non-agricultural purposes. Control of Substances Hazardous to Health Regulations 1994. Approved Code of Practice L9 (Second edition)
HSE Books 1995 ISBN 0 7176 0542 6

Recommendations for training users of non-agricultural pesticides Guidance HSE Books 1990
ISBN 0 11 885548 4

Guidance on storing pesticides for farmers and other professional users Agriculture Information Sheet AIS16
HSE Books 1996

Leptospirosis: Are you at risk? Pocket card INDG84
HSE Books 1990 (single copy free or priced packs of 20 ISBN 0 7176 2546 X)

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Website: www.hsebooks.co.uk (HSE priced publications are also available from bookshops and free leaflets can be downloaded from HSE's website: www.hse.gov.uk.)

DEFRA leaflets *Rats* WM04 (DEFRA 2003) and *House mice* WM05 (DEFRA 2003) are available free from DEFRA's Wildlife Administration Unit on 0845 601 4523. They are also available on DEFRA's website at www.defra.gov.uk/wildlife-countryside/vertebrates/leaflets.htm

The control of rats with rodenticides: A complete guide to best practice Central Science Laboratory. Available at www.csl.gov.uk/prodserv/cons/RatControlGuidelines.pdf

The control of rats with rodenticides: Guidance for best practice Central Science Laboratory. Available at www.csl.gov.uk/prodserv/cons/RatShortGuidelines.pdf

The BPCA codes of practice for operational procedures (BPCA 2002):

Guidelines for the safe use of Anticoagulant Rodenticides by professional users
Humane use of rodent boards
Guidance note for the management of mammals and birds using live capture traps
Available from BPCA Tel: 01332 294288

For information about health and safety ring HSE's Infoline Tel: 08701 545500 Fax: 02920 859260
e-mail: hseinformationservices@natbrit.com or write to HSE Information Services, Caerphilly Business Park, Caerphilly CF83 3GG.

This information sheet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

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