THINK WILDLIFE
Campaign for Responsible Rodenticide Use

CRRU Ireland

Rodent Pest Control in Rearing and Managing Game Birds

FIRST EDITION
OCTOBER 2017

Pheasant
Phasianus colchicus
(Piasún)

Grey Partridge
Perdix perdix
(Patraisc)

Red Grouse
Lagopus lagopus scoticus
(Cearc Fhraoigh)

Quail
Coturnix coturnix
(Gearg)

Introduction

Rats cause severe problems in game and wildlife management and rodenticides are often used to control them. A side-effect of the use of rodenticides is the exposure of non-target wildlife, including top predators such as Barn Owls, Kestrels and Red Kites. There is increasing evidence of exposure in a range of other wildlife throughout different levels of the food chain. The purpose of this booklet is to raise awareness of the issue of wildlife contamination with rodenticides, the pathways of exposure and to provide advice to gun club members and those that rear and manage game birds on best practice in rodent control and the reduction of the risk of exposure of wildlife to rodenticides.

1. Problems with rats

Rodents, in particular the Norway Rat (sometimes called Common or Brown Rat), can cause significant problems in game rearing and management. Some of the problems are well-known and others are not so obvious.

i) Predation of eggs and chicks

First and foremost, rats are voracious predators of birds' eggs and chicks. All ground-nesting birds are vulnerable including Pheasants and Partridges. Because rats can climb, nests located off the ground can also be predated. Predation of eggs and young by rats can be particularly troublesome in managing wild-bred birds.

ii) Consumption of game bird feed

Rats can also be a problem at and around release sites. Feed for poults, either whole grains or pellets, whether offered from covered feeding stations or from hoppers, is highly attractive to rats. Small numbers of rats may sometimes be tolerated but when infestations build up to levels at which a substantial amount of feed is lost to them and predation is a risk, remedial action is required.

Rats will live close to food sources. Do not continue to feed birds when rats are established near or beneath hoppers – relocate the hoppers!

Rats are voracious predators of the eggs and chicks of game-birds

Feed for poults, either grains or pellets, whether offered from open troughs or from hoppers, is highly attractive to rats and encourages the development of a serious infestation!

It is essential to provide supplementary winter feed in Pheasant and Partridge rearing and release pens, either by hand feeding or from hoppers. Rats quickly become accustomed to feeding areas and may take large quantities of the food that is intended to ensure healthy and stable game-bird populations through the hungry months of Winter and early Spring.

Static feed hoppers can be particularly attractive to rats, due to the presence of spilled grain that is not cleared up by the birds. Often, rat burrows are established in close proximity to hoppers. If appropriate action is not taken, rat infestations may increase and persist into the game bird nesting season.

iii) Infestation of cover crops

Cover crops of various types are often sown to provide cover and sometimes sustenance for game birds at certain times of year. Agri-Environmental Schemes aimed at protecting wildlife promote the planting of cover crops *i.e.* cereal and feed crop together or brassica crop such as kale, rape or mustard. Rats often take up residence in these, particularly if they are of high food value, such as maize.

However, Autumn cobs, grains and seed that were intended for game birds can be stripped by rats, which may then survive the winter to threaten game bird eggs and chicks the following Spring. Without adequate rat control, these crops can become heavily infested and pose an economic threat to both farm and game.

iv) Transmission of diseases

Very little is known about the transmission of diseases from rats to game birds and *vice-versa*. However, the range of diseases that are known to be transferred from rats to people is reason enough to ensure that high rat infestations are not established around any installation associated with rearing or release pens.

As well as Weils's disease that is caused by *Leptospira*, rats carry other less well-known disease organisms, such as *Toxoplasma*, *Listeria*, *Cryptosporidium*, *Salmonella* and *Campylobacter*.

For all of these reasons, it is essential to keep rats under control. However if rodenticides are used in this process, a potential result is the contamination of wildlife with anticoagulant rodenticides.

Rats enter rearing and release pens to obtain food and shelter. The feeding of game birds with cereal grain is an obvious source of food for rats

Game crops provide food and cover both for game birds and for rats. It is good practice to have a wide margin between cover and the crop so that rat runs are readily visible

2. Anticoagulants and wildlife

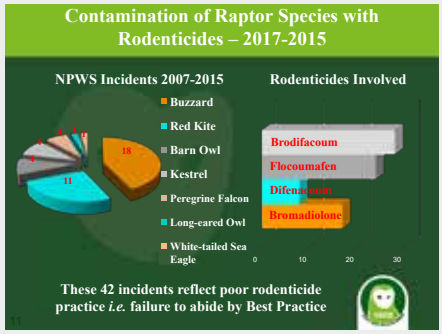
It has been known for some time that a side-effect of the use of anticoagulant rodenticides in the countryside is that most Barn Owls have become contaminated with residual traces of rodenticides. Research by BirdWatch Ireland has shown that more than 85 % of Barn Owls contain such residues.

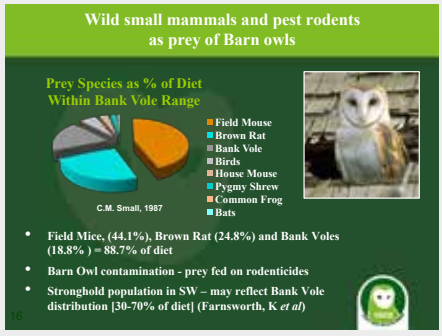
It is important to note that few of the birds examined contained potentially lethal quantities of the poisons, and most had died from other causes, such as starvation or collisions with road traffic or overhead cables. The sub-lethal effects associated with low-level contamination by anticoagulant rodenticides are not well understood, but the fact that the most Barn Owls are contaminated shows that, at some time in their lives, they have been exposed to rat bait.

It is not only Barn Owls that are affected. Traces of anticoagulant rodenticides have been found in a wide variety of birds and mammals in Ireland and elsewhere in Europe, including Buzzards, Red Kites, Kestrels, Peregrine Falcons, Sparrowhawks, Stoats, Pine Marten, Foxes, Badgers and even Hedgehogs. Some 42 incidents involving contamination of raptor species with anticoagulant residues have been reported for the period 2011 to 2015 by the National Parks and Wildlife Service. This makes anticoagulants one of the most widely distributed contaminants of wildlife.

Does this matter if the levels of these residues are generally very low? The answer of course is "yes". That is because, the sub-lethal effects on an individual or population are not known. It is a matter of concern for rodenticide manufacturers, for government departments that regulate rodenticide use in Ireland, for conservationists and for everyone who has an interest in the health of our wildlife and countryside. Fortunately, Gun Club members have a healthy respect for and knowledge of wildlife that inhabit farms where they operate.

Main Barn Owl image, RSPB-images; Pygmy Shrew, Richard T.Mills; Greater White-toothed Shrew, John Murphy; House Mouse, George Shuklin – Licensed under Public domain via Wikimedia Commons; Wood Mouse, David Perez – Licensed under Public domain via Wikimedia Commons; Bank Vole, Richard T.Mills; Brown Rat, Richard T.Mills; Pied Wagtail, Michael O'Clery; Bat, Licensed under Public domain via Wikimedia Commons, and Frog, Richard Bartx – Licensed under Public domain via Wikimedia Commons.





How is this contamination happening? One of the main routes of contamination for predators and scavengers is the consumption of target rodents (Norway Rat and House Mouse) which have been contaminated with rodenticide bait. Another main route of contamination for wildlife occurs where rodent predators feed on non-target small mammals such as (*e.g.* Wood Mouse and Bank Vole) which have been exposed to rodenticides.

So it is now known that much of our wildlife has been contaminated with rodenticides when these chemicals are applied where small mammals, such as Wood Mice and Bank Voles, live side-by-side with target rodents.

Extensive exposure of Peregrine Falcon and Sparrowhawk has been confirmed in the UK, providing evidence that there are other potential pathways for exposure within the food chain. Peregrine Falcon and Sparrowhawk typically feed on small birds rather than small mammals, indicating that other non-target species including birds and invertebrates may be exposed to rodenticides. Small birds, slugs and snails have been shown to enter bait boxes and feed on bait contained therein.

Images of some of the raptors and mammals which occur in Ireland and which are susceptible to rodenticide exposure are shown on pages **10** to **12**.

3. Controlling rats affecting game birds

Rats require food water and shelter to thrive. Many game management activities provide both of these necessities. Obviously, the most cost-effective way to manage rat infestations is to avoid having them in the first place, or at least to make sure that food and cover are in short supply, thereby keeping rat infestations at a minimum. This should always be the first step in rodent control programmes. If measures to modify the habitat are ineffective, or cannot be undertaken at all, it becomes necessary to conduct rat control programmes.

This booklet deals with these two aspects of rodent pest management.

i) Habitat Management

Usually, the main attraction to rats provided by game management activities is an abundant source of food. Every effort must be made to restrict rat access to this resource. There are many actions that can be taken to achieve this:

Supplementary feeding

Active Gun Clubs provide supplementary feed in their hunting territories throughout harsh Winter and 'hungry' Spring months, using barrel feed hoppers that are strategically placed throughout their reserves. Feed provided can benefit many wildlife species, however recent research showed that the main beneficiaries of game feeders on lowland farmland were rats, mice, corvids and pigeons (see further reading list).

Give careful consideration to feeding arrangements at release sites as feed inevitably attracts rats!

It is good practice to relocate feed hoppers periodically to prevent the build-up of potential for gapeworm (*Syngamus trachea*) infection of birds. The parasitic nematode worm infects the tracheas of certain birds and can obstruct the airway. When the female gapeworm lays her eggs in the trachea of an infected bird, the eggs are coughed up, swallowed, then defecated. When birds consume eggs found in the faeces of an intermediate host such as earthworms, snails or slugs, they become infected with the parasite.

Rats require food, water and shelter to thrive. Game rearing and management activities provide these necessities!

When feeding at rearing and release pens:

- Use purpose-made feed hoppers rather than covered feeding stations. If they are well-constructed and maintained, hoppers can substantially reduce the amount of feed taken by rats. Some feeder types (*e.g.* motorised feeders) can be closed, or removed entirely, to prevent access of rats outside of the times when birds are feeding.
- If feeding on the ground, provide only enough feed for poults so that they consume the feed quickly and little or none is then left around for rats.
- Where possible place feed dispensers at a distance from any cover. Open areas are less attractive to rats, because they are then vulnerable to predators.
- Keep the area as clean and tidy as possible. Do not leave excess spilled grain on the ground for rats. Also, do not leave clutter, such as stacks of old grain bags and old equipment around, in or near release pens.
- Release pens should, where possible, be sited in areas that are less attractive to rats. Pens put near to water-courses will always be more likely to become rat infested. Also, pens with a wide cleared area around the fencing will allow rat runs to be seen early and facilitate prompt control measures before infestations build up.

When feeding on rides (i.e. feeding clearings in woodland or crops):

- Only put down sufficient feed for the birds present at each feeding location, so the feed is quickly taken by the birds and not left for rats.
- Where feasible, position feeders under cover (*i.e.* woodland, spinney or tall crop) to discourage crows and pigeons.

When feeding on rides, spread the feed thinly and only provide sufficient feed so that it quickly consumed, leaving none for rats!

- Scatter the feed as widely as possible. Rats prefer to eat in quantity in one place and in short feeding bouts. They do not like to have to 'work' in the open to find small quantities of food as this leaves them vulnerable to predators.

When feeding from feed hoppers in hedgerows, coppices and woodlands:

- Use hoppers that do not provide easy access for rats to the feed they contain. It is better to use purpose-made metal hoppers, that are designed to minimise spillages.
- Clean up spillage on a regular basis.
- If rats become established at a feed hopper, remove or relocate the feed from it for a few days so that the rats are forced to find an alternative food source and can be more easily trapped or if necessary baited.

Good housekeeping is essential in all areas. Make sure that all debris, such as empty feed bags and dead birds, are cleared up regularly and removed from the site for effective disposal. This will also minimise rat problems.

The careful consideration of when and how supplementary feed is made available to the birds is important in avoiding serious rodent infestations!

Overall, the health and well-being of the birds will always take precedence, but the careful consideration of when and how supplementary feed is available to the birds is important in reducing problems with rats.

Cover crops

The planting of cover crops is a fundamental part of modern game management but this practice can help to support rat populations by providing both food and cover during the difficult overwintering period. If cover crops are planted, there is not much that can be done to deny them to rats. However, in areas where rats are known to be a problem the planting of alternatives to seed-bearing crops will help to keep rat numbers down.

ii) Controlling rat infestations

Those responsible for rearing and those responsible for managing game birds are likely to be faced, at some point, with the need to get rid of rat infestations before they can have a negative impact on game and wildlife. First and foremost, this should be done as soon as rats are observed. It is much easier to deal with a small number of rats than with an established infestation. It requires less time and effort and, if it is deemed necessary to use rodenticides, less will be required. This keeps down the cost and results in less rodenticide entering the environment.

When rodenticides are used in the countryside, especially products containing the second-generation anticoagulants bromadiolone, difenacoum, brodifacoum, difethialone or flocoumafen it is inevitable that some will enter the food chain and will contaminate wildlife. **The only way to prevent contamination of wildlife is to avoid use rodenticides.**

Rodenticide use must be seen as a last resort and **not** the basis for the first approach to be used when rats appear. Rodent control strategies must always be based upon the concept of "risk hierarchy" whereby the least severe methods, in terms of risk to humans and wildlife, are considered first. The control method, whether biological, mechanical or chemical, that presents least risk for humans and wildlife that is effective should be selected for use.

- If using rodenticides, information on the product label must be adhered to - application details, manner and area of use, details of required restrictions, resistance information, and risk and safety information. Use other than in accordance with label instructions is an offence!
- Those involved in game rearing and management must become acquainted with the risks associated with the use of rodenticides, and must implement all appropriate risk mitigation measures.
- Many anticoagulant rodenticides are approved for use by both professional users (*e.g.* farmers and gamekeepers) and by trained professional users (*i.e.* rodent pest control officers) in and around buildings. However the use of products approved for use in open areas including in game bird rearing pens and release pens is restricted to trained professional users (see further reading, CRRU Ireland *Best Practice Requirements for Rodent Control and Safe Use of Rodenticides* for a full definition of 'open areas' - www.crru.ie.)

A rodenticide should only be used as a last resort, and not as the basis for the first approach to their control! Shooting, trapping using cage traps and hunting with terriers are the traditional and preferred methods of rat control by Gun Clubs!

The use of rodenticides approved for use in open areas, including in game rearing and release pens, is restricted to 'trained professional users' that have been duly registered by the Department of Agriculture, Food and the Marine!

(a) Trapping, shooting and terriers

A system of tunnel traps is often used as part of a managed programme of pest and predator control. This helps prevent rats from becoming a problem at release pens and in hedgerows by keeping up constant control pressure on them. Even considerable rat infestations can be removed by a skilful and well-managed trapping programme.

Trapping is an excellent means of rat control. Always set traps in robust tunnels to reduce access by non-target species. Check traps at least daily!

Trapping, if done well, also has a minimal impact on non-target animals and the wider environment. However, traps that are poorly set and not properly protected, as they must be in tunnels, can cause casualties among non-target species.

Tunnel traps should be established before rats become apparent, so that they are accustomed to moving through them from the start. The traps should be set as soon as rodent signs are noticed and rats are using tunnels confidently. More detailed advice is provided on trapping for controlling rats in the document CRRU Ireland *Best Practice Requirements for Rodent Control and Safe Use of Rodenticides.*

Rats can be shot with suitable firearms such as air rifles and shotguns. A .22 rimfire rifle loaded with lighter cartridges such as the '.22CB Long' is also effective but needs to be used with care to prevent ricochets. Shooting is limited to situations where rats are visible, in range and present a safe shot, which imposes limitations on its value as a method of control. However it can be useful where an infestation around a barn is being managed or when a game crop is being ploughed out.

Terriers and other suitable dogs can also be used for killing rats. This is lawful and can make an effective contribution to rat control in certain circumstances, for example when an old stack of bales is being dismantled. Like shooting, it is unlikely to provide a satisfactory control method on its own but deployed alongside other methods, it may have a useful role to play. Be aware of animal welfare issues.

(b) Gassing

Terriers & other dogs may be useful in taking rats in some circumstances

Fumigant gases, evolved by the application of phosphine gas generating tablet and pellet formulations, provide a very effective method for rat control. The use of fumigants has the added benefit that its effects are virtually immediate. Burrow fumigation should be used in preference to the application of anticoagulant baits

Burrow gassing is a specialist operation to be done by trained operatives. It is not likely to cause harm to wildlife when only rat burrows are gassed!

because, when used in the approved manner, adverse impacts on non-target animals are rare and no significant residues of fumigants remain in the environment or enter the wildlife food chain.

However, the use of gassing for rodent control requires considerable skill. It is not a job for the inexperienced and only those who hold a current nationally recognised qualification in the safe use of phosphine gas may purchase and use phosphine generating fumigants. Detailed rules for the safe use of such products are provided in the CRRU Ireland *Best Practice Requirements for Rodent Control and Safe Use of Rodenticides.*

Gas and gas generators may only be used for the control of rodent pests by specially trained and certified personnel!

(c) Anticoagulant Rodenticides

Only use rodenticides when the other methods described in this booklet are either ineffective or impracticable. Always read and carefully follow product label instructions for the specific bait that you are using. These differ among baits and the active substances contained in them. Only apply rodenticides in places where the product label says such use is permitted.

Users need to be aware of two mechanisms by which rodenticides can affect non-target animals.

- Firstly, non-target animals may gain direct access to rodenticide baits and consume them. This is called 'primary poisoning'. Much can be done to prevent this by the careful placement and covering of bait points (see below). Non-target small mammals, such as Wood Mice and Bank Voles, can easily gain access to rat baits put out for target rats and mice and are a primary source of contamination of wildlife.
- Secondly, predators and scavengers may eat animals, both target rodents and non-targets, which themselves have taken rodenticide baits. This is called 'secondary poisoning'. It can be reduced by frequently checking and picking up the bodies of poisoned rodents, although those not yet dead may still be caught and eaten by predatory species. An equally important task, therefore is to deny access of non-target rodents to bait points in as far as is possible.

If rodenticides are needed, they must always be applied in accordance the label instructions for the product selected

Kestrel

Pocaire gaoithe

Wingspan 75cm, Length 34cm

Common throughout the country. Hovers while hunting. Feeds predominantly on small mammals and birds, also takes frogs, lizards and invertebrates.

Hen Harrie

Cromán na g

Wingspan 110cm, Length 48cm

Scarce raptor, breeds in upla areas, widespr during winter. on small mam and small bird

Buzzard

Clamhán

Wingspan 120cm, Length 54cm

Recolonised after long absence. Common in farmland habitats in most parts of the country. Hunts and scavenges, takes small mammals including rats, as well as crows and rabbits.

Iris
which
rode

Long-eared Owl

Ceann cait

Wingspan 95cm, Length 36cm

The commonest of our owls, nesting in old crow nests in woodlands, copses and sometimes gardens. Nocturnal, feeds mostly on small mammals including rats and mice.

Merlin

Meirliún

Wingspan 56cm, Length 28c

Smallest raptor in Irela Incredibly agile, hunts

Design M.O'Clery. **Text &**
Buzzard, S.Connolly; Hen Harrie
Sparrowhawk in flight, Wikin

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White-tailed Eagle
Iolar mara

Wingspan 220cm, Length 85cm

Re-introduced after a long absence. Small breeding population, on inland lakes and along the coast. Varied diet, feeds on carrion, and catches fish and occasionally birds.

Peregrine
Fabhcún gorm

Wingspan 103cm, Length 42cm

Powerful raptor, feeds on birds. Nests on cliffs, quarries or large ruins.

Red Kite
Cúr rua

Wingspan 150cm, Length 67cm

Re-introduced after a long absence, established in the east in Wicklow and north Dublin, slowly spreading. Hunts and scavenges, will take rats and mice.

Sparrowhawk
Spióróg

Wingspan 62cm, Length 34cm

Common but elusive. Hunts for birds, low and fast.

Barn Owl
Scréachóg reilige

Wingspan 89cm, Length 34cm

Nocturnal, hunts small mammals. Nests in ruined buildings.

m
nd, inhabits moorland.
mainly small birds.

concept John Lusby. **Photo credits** Background, M.O'Clery; Female Kestrel, M.Finn; male Kestrel, J.Fox;
r, S.Connolly; Short-eared Owl, S.Connolly; Peregrine, M.Finn; Peregrine in flight, C.Clarke; Barn Owl, M.Brown;
nedia.org – C.Knoch; Sparrowhawk, wikimedia.org – P.Dalous; Merlin, S.Connolly; Long-eared Owl, R.T.Mills;
White-tailed Eagle, V.O'Sullivan. Red Kite, S.Connolly.

Irish Mammals
which are susceptible to rodenticide exposure

BirdWatchIreland

Badger
Broc Length 85cm
Widespread, nocturnal mammal. Omnivorous, diet dominated by invertebrates, also fruits, berries, cereals, fungi, and will take carrion and can take small mammals and other live prey.

Stoat
Easóg Length 30cm
Our smallest carnivore, native sub-species. Widespread, uses a range of farmland habitats and woodland. Diet includes rabbits, small mammals, birds, eggs, invertebrates, occasionally fruit and berries.

Hedgehog
Grainneóg Length 25cm
Widespread, but likely in decline. Nocturnal and hibernates in winter. Mostly insectivorous, but will take frogs, small mammals, birds and eggs.

Fox
Madra rua Length 100cm
Widespread and generally common in most habitats. Mostly nocturnal. Opportunistic and varied diet including small mammals. Research in Northern Ireland showed high proportion of individuals exposed to rodenticides.

Bank Vole
Luch rua Length 15cm
Non-native, introduced to the south west in the 1920's. Now occurs throughout Munster, parts of the midlands and west, continuing to expand range. Preference for woodlands and hedgerows. Omnivorous. An mportant prey item for predators.

Pygmy Shrew
Luch féir Length 9cm
Long-established and widespread in Ireland. Smallest Irish mammal. Insectivorous and will take a variety of invertebrate prey. Important prey item for many predators.

Greater White-toothed Shrew
Length 12cm
Recently introduced to Ireland, main range is the south west but expanding. Insectivorous. An important prey item for many predators.

Wood Mouse
Luchóg fhéir Length 16cm
Widespread and adaptable, found in most areas, prefers habitats with ground cover. Opportunistic feeder, will take both animal and plant foods. Important prey item for many predators.

Pine Marten
Cait crainn Length 66cm
Pine Marten is native to Ireland. They are recovering from very low numbers in the 1970s, now widespread but elusive, generally inhabit forests. Diet includes berries, fruits, invertebrates, birds and small mammals.

Design M.O'Clery. **Text & concept** John Lusby. **Photo credits:** Background image, M.O'Clery; Badger, BadgerHero – Wikimedia Commons; Stoat, Dermot Breen; Hedgehog, 'Gibe' Wikimedia Commons; Fox, Malene Thyssen – Wikimedia Commons; Bank Vole, R.T.Mills; Pygmy Shrew, R.T.Mills; Greater White-toothed Shrew, John Murphy; Wood Mouse, David Perez Wikimedia; Pine Marten, Noel Marry.

Poisoned rats carry residues that can be passed on to wildlife that feed on them!

and in accordance with the *Best Practice Requirements published by the Campaign for Responsible Rodenticide* Use Ireland (CRRU Ireland) (http://www.crru.ie), and with the CRRU Code, which is reproduced at the back of this booklet. That guidance is intended to reduce both primary and secondary exposure of wildlife to rodenticides, thereby minimizing the risks arising for wildlife associated with their use.

The application of bait directly into rodent burrows is a preferred method of

If a rodenticide must be used it is best to bait rat burrows. Place the bait as far as possible into the burrow using a long-handled spoon!

application. If this is done, it makes it less likely that non-target small mammals will have access to the bait. The following recommendations will allow efficient bait application with the minimum likelihood of exposure of wildlife:

- Use a long-handled spoon to get the bait as far into the burrow as possible.
- Use the quantity of bait specified on the product label and record the location of baited burrows, so that they may be found again and checked.
- Lightly block the entrances of baited burrows with a little loose soil or a twist of grass or paper.
- Come back frequently, preferably in the early morning each day, to monitor the take-up of bait, replace bait kicked out of the burrow by rats.
- Wax blocks baits may be used as they are not readily taken by birds. They can be held in position in the burrow on a piece of bull wire or a long nail driven though the block into the ground.
- Search each day for rodent carcasses and dispose of them with the site's or farm's domestic waste, or by burial on site to a depth of at least 50cm but away from sensitive sites such as water courses or protected sites *(https://www.npws.ie/protected-sites)*.
- When it is clear that burrows are no longer occupied by rats, close the mouth of the burrow, having removed all remaining bait, as far as possible, and disposing of it in accordance with the instructions on the product label.
- Heel in the burrow to make sure that any remaining bait residue is inaccessible and will rot down quickly.

Lightly block baited rat burrows with grass, paper or straw to help prevent bait being expelled. Check burrows daily and clear up any bait that has been kicked out

Rodenticide bait must never be left exposed in outdoor situations. When used outdoors, rodenticide bait must be placed in secure anchored bait boxes!

If burrow baiting is not feasible, it is essential to place bait in protected bait stations. Never leave rodenticide baits out in the open. However, even when bait is placed in bait stations it is accessible to any animals of similar size or smaller than rats. In particular, Wood Mice and Bank Voles will enter boxes and feed on rodenticide baits. Small birds may overcome their fear of entering a confined space and eventually enter bait boxes to consume bait. Slugs and snails will also feed on rodenticide bait. If mouse droppings are found in bait boxes, these will inevitably be those of non-target rodents. This is because House Mice are less likely to inhabit hedgerows, particularly away from buildings. Baits should never be left in boxes that are being used by non-target rodents, as this is the main cause of wildlife exposure and contamination.

Bait stations must be robust enough to deter animals such as Dogs, Foxes and Badgers, as all these animals will take rat baits if they are accessible to them. Rats tend to take bait more readily when the interiors of the bait stations allow them plenty of room.

The practice of pre-baiting is recommended. In this, non-toxic or placebo bait such as whole wheat is put out in the same places as the poisoned bait will be placed. Poison bait is substituted for the pre-bait when rats are feeding freely. This may reduce the overall duration of the poison baiting programme and allows the identification of the species feeding on the bait to be made. Only bait stations that are used by rats should be baited with poison bait.

Short, effective, targeted treatments are ideal of a duration of 21 to 35 days at most, depending on the product selected for use. Only leave bait out when there is a rat infestation to control. It should never be left out on a continuing basis 'just in case' – it is an offence to do so, unless baiting is done by a trained professional pest control officer using a product for such use that contains either difenacoum or bromadiolone, in situations where there is high potential for re-invasion and other methods of control have been tried and found insufficient. It is obvious that efficient baiting programmes, which are as short as possible, will control rats quickly, while minimising the exposure of wildlife to rodenticides.

Conversely, wildlife exposure is prolonged during ineffective baiting programmes in which baits are badly positioned, are too few, contain the incorrect amount of rodenticide and are not managed according to label instructions.

If control is not achieved in 21 to 35 days, depending on the product used, the control programme adopted must be reviewed to establish the reason for the failure. In short, if you need to use rodenticides, use them properly.

Always keep careful records of all activities when conducting rat control using rodenticide baits, including:

- An assessment of the size and distribution of the rat infestation.
- The trade name of the bait used and the active substance it contains.
- An environmental risk assessment and records of the measures adopted to minimise non-target access to the bait. A form for use in conducting environmental risk assessment and advisory notes on conducting such assessments are provided at http://www.crru.ie/downloads/.
- The numbers of bait points put out and their exact locations.
- The amount of bait put down and the dates of bait laying operations.

- Whether bait was applied directly into burrows or whether bait stations were used.
- The dates and times of visits to check bait points and to pick up dead rodents.
- The numbers of dead rodents found and how they were disposed of.
- The dates when baits were removed from the baited area.
- The approximate quantity of uneaten bait picked up and how it was disposed of.
- An assessment of the effectiveness of the treatment.

Use rodenticides safely - always read the label and product information before use

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Failure to follow label instructions -

- ***Reduces effectiveness***
- ***Unnecessarily exposes wildlife to poisoning***
- ***Is an offence***

By following these recommendations, those that rear and manage game birds can be sure that rodent pest management is carried out in the best possible way, with minimum impact on wildlife and the wider environment. The correct use of rodenticides, where such use is warranted, will forestall possible calls on the Regulators to further restrict the marketing and use of rodenticides and help to keep this important rodent pest control method available for game bird management.

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- James Fitzharris, Countryside Alliance Ireland (CAI),
- John Toal, National Association of Regional Game Councils (NARGC),
- Trevor Myles, Pesticide Control Division. Department of Agriculture, Food and Marine (DAFM).

Further Reading

Campaign for Responsible Rodenticide Use. More information available on-line at: http://www.crru.ie

CRRU Ireland *Best Practice Requirements for Rodent Control and Safe Use of Rodenticides*, available on-line at: http://www.crru.ie/best-practice/

Effective Control of Rodent Pest on Farms, CRRU Ireland 2016, available on line at: http://www.crru.ie/downloads/

Carlos Sánchez and Francis Buner. The use of game feeders on lowland farmland. Game and Wildlife Review 32:2012

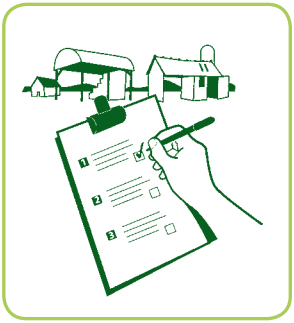
The CRRU Code

The rodenticide industry, acting as a whole, has recognised the need to address the concerns surrounding the responsible use of rodenticides and the need to ensure that rodenticides are used correctly and in ways that will minimise the exposure of wildlife. The industry has therefore initiated the Campaign for Responsible Rodenticide Use (CRRU).

Key to the campaign is a code of good practice for the responsible use of rodenticides in rural areas.

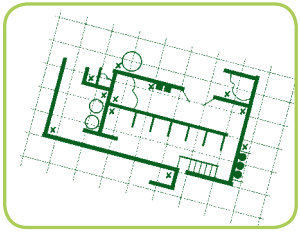
This stresses the need to adhere to the following good practice. It has adopted the logo 'Think Wildlife' to build recognition of the code and the overall campaign aims.

CRRU code is:



Always have a planned approach

- Before treatment begins, a thorough survey of the infested site is an essential key to success when using any rodenticide.
- Environmental changes which could be made to reduce the attractiveness of the site to rodents should be noted for implementing after the treatment. Usually this will involve rodent proofing and removing rubbish and weeds that provide harbourages and cover. However, the site should not be cleared before treatment since this will disturb the rodent population and make bait acceptance more difficult to achieve.
- Obvious food, such as spilled grain, should be removed as far as possible and any food sources covered.
- Rodenticide baits should only be used for as long as is necessary to achieve satisfactory control.
- In most cases, any anticoagulant bait should have achieved control within 35 days. Should activity continue beyond this time, the likely cause should be determined and documented. If bait continues to be consumed without effect, a more potent anticoagulant should be considered. If bait take is poor, relative to the apparent size of the infestation, consideration should be given to re-siting the bait points and possibly changing to another bait base, as well as making other environment changes.



Always record quantity of bait used and where it is placed

- A simple site plan or location list identifying areas of particular concern pertinent to the site should be drawn up and retained on file.
- A record of all bait points and the amount of bait laid should be maintained during the treatment. Activity should be noted at each bait point, including any missing or disturbed baits, as the treatment progresses.
- By carefully recording the sites of all bait points responsible users of rodenticides are able to return to these sites at the end of the treatment and remove uneaten bait so that it does not become available to wildlife.

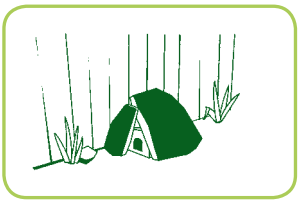
Always use enough baiting points

- Users should follow the label instructions regarding the size and frequency of bait points and the advice given regarding the frequency and number of visits to the site.
- By using enough bait points the rodent control treatment will be conducted most efficiently and in the shortest possible time. This will restrict the duration of exposure of non-target animals to a minimum.

Always collect and dispose of rodent bodies

- The bodies of dead rodents may carry residues of rodenticides and, if eaten by predators or scavengers, may be a source of wildlife exposure to rodenticides.
- It is essential to carry out regular searches for rodent bodies, both during and after the treatment period. Bodies may be found for several days after rats have eaten the bait and rats may die up to 100 metres or more away from the baited site.
- Any rodent bodies should be removed from the site and disposed of safely using the methods recommended on the label.

Never leave bait exposed to non-target animals and birds



- Care should be taken to ensure that bait is sufficiently protected to avoid accidentally poisoning other mammals and birds. Natural materials should be used where possible.

- Bait stations should be appropriate to the prevailing circumstances. They should provide access to the bait by rodents, while reducing the risks of non-target access and interference by unauthorised persons. They should protect the bait from contamination by dust or rain. Their design, construction and placement should be such that interference is minimised.

Never fail to inspect bait regularly

- Where the risk assessment or treatment records show that multiple visits are required, then those should be made as frequently as is considered necessary. Daily inspection may be required in some circumstances.

- At each visit, baits should be replenished according to the product label and a thorough search made to ensure that bodies and any spilled bait are removed and disposed of safely. Records of such visits should be maintained.

Never leave bait down at the end of the treatment

- Bait left out at the end of a treatment is a potential source of contamination of wildlife.

- On completion of the treatment, records should be updated to signify that the infestation is controlled and that, as far as reasonably practical, all steps have been taken to ensure that the site is now free of rodenticide bait.

For further details on CRRU see:

www. thinkwildlife.org

info@thinkwildlife.org

Notes

CRRU Ireland (www.crru.ie) was formed following prompting by the regulatory authorities by companies that manufacture and distribute rodenticides in Ireland. Its aim is to promote the responsible use of rodenticides and has as prime objective the minimisation of harm to wildlife.

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Campaign for Responsible Rodenticide Use

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For further details please visit the CRRU website:

www.crru.ie

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