

# TRAINING GUIDE

# RODENT CONTROL



International

*Leading the way in global pest control*

## Rodent Control Training Guide

This booklet is a one-stop guide to successful rat and mouse control for anyone supplying farmers with rodenticides. It has been written by experts from PelGar International, drawing on many years practical experience of dealing with rodent infestations in rural situations.

Outlining the basics of rodent biology and behaviour, the booklet offers helpful guidance on product choice, which can be passed onto customers who come in seeking solutions to the rat and mouse problems on their farms.

PelGar also offers free training workshops for store-staff and customers – call Nic Blaszkowicz on 01420 80744 or email [nic@pelgar.co.uk](mailto:nic@pelgar.co.uk) for more information.



Brown rats - *Rattus norvegicus*

## The Culprits

There are a number of species of rodent in the UK but only three 'commensal' species, those that live with and around humans, pose a significant public health threat.

It was the Black Rat (*Rattus rattus*) that brought the plague to the UK centuries ago, but they are now rare in the UK.

The two key rodents of concern today are the Brown Rat (*Rattus norvegicus*) and the House Mouse (*Mus musculus*). Both have their own specific behaviours and habits, and the more that can be understood about these, the easier control becomes.



Black rats - rarely seen

## The Brown Rat - *Rattus norvegicus*

Weight: 250-400g

Eating habits: Omnivorous, 2-3g/meal, up to 10 feeds daily – approx 30g/day

Drinking habits: Requires 10-30g of water/day

Life span: 1.5-2 years

Neophobic - fears new objects

Rural rats behave very differently from urban rats. Brown rats in towns often live in sewers and landscaped areas, attracted by the abundance of food, water and shelter. 'Town' rats are less conservative in their eating habits and less scared of new objects, as their environments are constantly changing.

'Country' rats are common on most farms. During the warmer months they live out in the fields and hedgerows, feeding on seeds, berries and small invertebrates. However, these food sources start to run out by mid-autumn.

When the crop harvest is over and any spilt grain has been eaten, rats begin to move toward villages and farms in search of food. Country rats rarely live indoors, preferring to harbour in burrow systems under concrete plinths or in earthen banks near farm buildings and close to a food source. Rats will then move into buildings to feed. This habit often gives rise to visible 'paths' from the nesting site to the food source.

'Country' rats live in small family groups, usually with 20 to 30 individuals – but occasionally with more than 50. Most farms have more than one colony of rats and each competes for a defined territory. When one family group is killed off, either by a rodenticide campaign, or displaced for example by building works, other rodent groups living on the fringes soon move in to take their place.

In the urban environment, family 'clans' are less well defined. Colonies may be very small, as young males are quickly excluded from the family to go and make their own way in the world.

Brown rat feeding on bait



## Neophobia

Neophobia, or fear of new objects, is a phenomenon associated with Brown rats – particularly those living in rural areas. This inherent wariness includes new food sources, so it may take several days for them to accept them as safe to approach and eat. It is important to bear this in mind when placing bait down for the first time – it is best to allow several days for initial bait take and then move any bait points that haven't been touched into the areas of those that have. A large number of small bait points will be more effective than a few large bait points.

Once a food source is accepted the rats will keep returning to it until the supply is exhausted. It is therefore vital that once a colony starts taking bait that the stations are topped up regularly to stop the rats going elsewhere in search of food.

Rats will eat about 10% of their bodyweight each day – taken in around ten 2-3g meals. It is therefore, more efficient, and safer to non-target animals, to place several bait points with small amounts of bait in them, rather than one to two large ones.

## Rats need to drink

Rats have to drink fresh water every day to survive. The amount they need will depend on the moisture content of their food – but may be as much as 30g of water. This means rats need to access a water source – anything from a leaking tap to standing water in the farmyard. Limiting the number of places where rats can drink will help to focus a control programme.



Rat footprints easily seen in damp earth and on a dusty beam

## The House Mouse - *Mus Musculus*

Weight: 25-30g

Eating habits: Omnivorous, 0.1-0.2g/meal, up to 50 feeds daily – approx 3g/day

Drinking habits: Mice can survive on the water contained in their food alone.

Life span: 1.5 years

Neophobic – Uncommon – mice are generally very inquisitive and like exploring.

The House Mouse prefers to live inside houses or farm buildings. Mice colonies can literally be 'under our feet', nesting in furniture, bedding and domestic appliances. Kitchens are a favourite location, and this is where risk of disease transmission from rodent to human is greatest.

Mice eat 10% of their bodyweight in food each day, but unlike rats, take these in numerous meals. This means that a large number of small baiting points are usually needed to deal with an infestation of mice.

Unlike rats, mice can survive on dietary water alone. As long as the moisture content of their food is over 12%, they do not have to travel in search of fresh water. So if food is close to hand, they can live in very small areas; sometimes their territory will be as little as one square metre.



House mouse acrobatics

## Why are rodents such bad news?

Rats and mice cause millions of pounds worth of damage to UK farms and businesses every year – and the problem keeps getting worse.

> Rodents contaminate and consume animal feed, stored crops and domestic foodstuffs. A hundred rats will eat around 3kg of food a day. However, they will spoil up to ten times what they eat with urine and hair.

> They cause structural damage. Apart from physical damage that can be seen above ground such as gnawed doorways, rats like to burrow under concrete plinths and foundations. Where infestations are severe, this can cause subsidence, building collapse and damage to sewage systems.

> Rodents create fire hazards by chewing electrical wiring. Around half of farm fires are attributed to wiring being chewed by rats or mice.

> They spread disease to livestock and farm staff such as leptospirosis (Weil's Disease) and salmonella. They also pose a threat to bio-security particularly during epidemics such as Foot and Mouth and Bird Flu.



## How to get rid of rats and mice

Live traps, 'snap' traps, glue boards and electric or sonic deterrents are sold widely across the UK. However, while they may be able to kill one or two rodents, they are unlikely to completely eliminate an infestation. In fact, they may simply push a colony from one place to another. The best way to control an infestation is by using a suitable poison.

### Anticoagulant Rodenticides

Anticoagulants are the most effective rodenticide baits on the market. They work by preventing the assimilation of vitamin K1, one of 12 'blood clotting factors' within vertebrates.

Once a lethal dose of poison has been eaten by the rodent, there is a lag period while the existing vitamin K1 in the body is used up. This normally takes three to four days, after which the blood will no longer be able to clot, and any haemorrhaging inside the body will lead to death.

The great advantage of the lag period is that rodents never associate the bait they have eaten, with the symptoms of poisoning they go through. This means it is possible to attain 100% control of the population, as the rats will continue to feed on the bait ignorant of the fact it is killing them.





‘Acute’ poisons which work more quickly (within minutes of being eaten), have several disadvantages over anticoagulants. Firstly, if a sub-lethal dose is consumed, rats and mice may become ill but not die. Such illness is remembered and the rats will avoid eating the bait again – compromising the control programme. Typically only 55-65% of the population will be killed when acute poisons are used.

A significant advantage of anticoagulants is safety. In cases of accidental poisoning of non-target species such as cats, dogs and children, the lag period allows these baits to be effectively anti-doted.

## Active ingredients

The most widely used anticoagulant active ingredients used in the UK as rodenticides are:

- Difenacoum
- Bromadiolone
- Brodifacoum

Each has a different level of toxicity to mice, rats and non-target animals such as birds and dogs.

Anticoagulant (Active)	Difenacoum	Bromadiolone	Brodifacoum
<b>Dosing</b>	Multi-feed	Multi-feed	Single-feed
<b>Users</b>	Amateur & professional	Amateur & professional	Professional only
<b>Areas of use</b>	Indoor & outdoors	Indoors & outdoors	Indoors only
<b>Lethal dose – Rat</b>	9.0g	5.6g	1.3g
<b>Lethal dose - Mouse</b>	0.4g	0.9g	0.2g

The above table shows the lethal dose required for rats and mice and the restrictions that apply to use.

## Single vs multi-feed baits

Difenacoum and bromadiolone are used to produce multi-feed baits – meaning both rats and mice will have to consume several meals to ingest a lethal dose. However with the right bait placed in the right locations it is quite feasible for rats and mice to consume a lethal dose in a single days feeding.

Both these poisons can be used by amateur and professional users. Farmers are currently classified as competent users and as such professionals.

The ‘single-feed’ properties of baits containing brodifacoum may seem attractive to customers. However, rodents that consume a lethal dose will actually take the same amount of time to die as those taking a bait containing difenacoum or bromadiolone.

They are also likely to continue feeding for two to three days and as such when they do die may contain more than 50 lethal doses of brodifacoum. This poses considerable risk of secondary poisoning to any animal that may then eat the dead or dying rodent.

For this reason it is very important when using single feed baits, and good practice in any rodent control campaign, to ensure the treated area is regularly visited and carcasses and found and properly disposed of. The most up-to-date disposal information can be found on the back of all packs.

**Grams of bait to deliver an LD50 dose to 1kg of body weight:**

	50ppm Difenacoum	50ppm Bromadiolone	50ppm Brodifacoum
<b>Rabbit</b>	40.0	20.0	5.8
<b>Pig</b>	1600.0	60.0	10.0
<b>Dog</b>	1000.0	200.0	5.0
<b>Cat</b>	2000.0	500.0	500.0
<b>Chicken</b>	1000.0	1000.0	200.0
<b>Sheep</b>	2000.0	-	60.0

Table to show relative toxicity to non-target animals. Figures shown are grams per kilo for a lethal dose.

## Toxicity Profiles

As you can see from the table opposite difenacoum is very effective against mice and has a good level of activity against rats. It also has a good 'farmyard profile' – being the least toxic to non-target animals such as dogs, pigs and birds. Difenacoum will always be the product of choice where mice are the main problem, or where there may be risk of secondary poisoning.

Bromadiolone is considerably less effective than difenacoum against mice, but has slightly higher activity against rats. It also has a good 'farmyard profile' but is not as 'friendly' as difenacoum.

Brodifacoum is much more toxic to both target and non-target animals than difenacoum or bromadiolone, and is particularly potent against dogs, rabbits and pigs. This is why it is restricted to indoor use only and for use by professional users only.

## Palatability matters

As difenacoum and bromadiolone are multi-feed poisons, it is critical that the bait is palatable and attractive enough to encourage rodents to return for further feeds, so they can consume a lethal dose.

PelGar International has invested significant time and money in the development and production of a wide range of formulations that will tempt rodents away from their existing food source.



Wax block moisture testing

## Rodenticide formulations

There are five key formulation types available. PelGar International is in the unique position of being licensed to produce rodenticides using all three active substances - difenacoum, bromadiolone and brodifacoum. The company can offer a choice of anticoagulant baits to suit the specific needs of each user.

Formulation	Difenacoum (ROBAN)	Bromadiolone (RODEX)	Brodifacoum (VERTOX)
Cut Wheat	●		
Whole Wheat	●	●	●
Pellet Bait	●	●	●
Block Bait	●	●	●
Pasta Bait	●	●	●

Table to show the broad range of available products from PelGar. International Ltd.

There is no such thing as a universal rodenticide that will work in every circumstance. Certain active ingredients and formulations will work better in different situations. The best bait is the one that the rodents will eat in preference to any other food source nearby.

There is no harm in buying and trying two different formulations to see which one is the most readily accepted. All products carry a two-year shelf life so there is always plenty of time to use them up.



### **Cut Wheat Bait**

Cut wheat baits are particularly effective against mice, which have a tendency to 'kibble' whole grain baits, peeling off the treated outer surface and only eating the inside. For this reason, PelGar's cut wheat bait is only available as difenacoum bait – as this is the most effective general use anticoagulant to use against mice.

PelGar's cut wheat bait is made using top-quality, dust-free chopped wheat, ensuring a high quality product with minimal wastage.



### **Whole Wheat Bait**

Whole wheat baits are highly palatable and effective against most pest rodents, particularly where the population has been feeding on whole grain foodstuffs. While mice peel off the outer shell of a grain, rats will pick up a grain in its paws and eat it in three or four bites.

PelGar's whole wheat baits are available in all three active substances. They are made from micronised grain, which has been treated to prevent germination and start the conversion of starches to sugars, making it even more attractive to rodents.



### **Pellet Bait**

Pellet bait offers a well balanced meal and is ideal where the target population has been feeding on compound feedstuffs such as dairy cake.

PelGar's pellet bait is made using a blend of cereals, sugars, proteins and fats and is attractive to both rats and mice.

## Block Bait

Block baits are formulated using edible waxes which bind the ingredients together, including high quality culinary grade wheat flour and chopped wheat.

PelGar's blocks come in two forms: an eight-sided 'cast' block which has a good degree of moisture resistance so can be used in damp conditions, or extruded into a rectangular block which retains a high degree of palatability.

All PelGar blocks are made with a hole in the centre so they can be wired into place or threaded onto a spindle inside a bait station. This offers complete bait security from non-target animals.



## Pasta Bait

Pasta bait is relatively new in the UK, and is sometimes referred to as 'paste' bait or 'fresh bait'. It is made from a mixture of wheat flour, chopped grain, soft lard and synthetic peanut flavouring and offers a high calorie, highly palatable feed which is ideal for most situations. It is particularly useful where rodents are being slow to take other types of bait, or where it is proving difficult to tempt them away from their current food source.

PelGar pasta baits are available in mastic tubes or in 15g 'T' bags, which can be wired into place inside bait stations, reducing the likelihood of their removal by rodents.



## Other ingredients

PelGar baits have been designed to ensure rats and mice find them, eat some, then return later to eat some more. Special aromas help rodents locate them easily and synthetic taste additives encourage repeated feeding.

Biological preservatives stop the growth of fungi or bacteria when used in damp conditions. Strong dyes are included which colour the rats' droppings, giving a good indication as to whether they are eating the bait.



Rat droppings

# Successful Rodent Control - The PelGar Guide

Effective rodent control is not just about putting down bait anywhere and hoping for the best.

PelGar has devised a programme that offers farmers the best chance of controlling rat and mouse infestations in rural situations.

## Step 1: Tidy up

Before baiting clear away any existing food sources that may distract rodents from laid baits. However, do not disturb the farmyard 'environment' too much immediately before baiting, as such housekeeping will simply disrupt the rodents' normal activities, making control more difficult.



## Step 2: Look for signs



Monitor rodent activity and make a site plan of where they are living and feeding, and the routes they use to travel between these areas. Look for signs of damage, such as gnawed doorways, footprints in mud or fresh droppings.

Keep an eye open at all times and act sooner rather than later. It is always easier to control a small infestation than it is a plague.

## 3: Choose the right rodenticide

There are usually one or two products best suited for a particular situation. Consider what the rodents have been feeding on and try and match the appropriate bait to this.

## 4. Follow a sound baiting routine

Place bait stations in the areas of most activity and inspect regularly – daily if possible, but at least once every two to three days at the start of a campaign. A small initial infestation of rats may require 10 to 15 baiting points. Top up empty bait stations immediately and do not skimp on bait. Under-dosing is the main reason for baiting programmes to fail. Move any bait stations that have not been touched after five to seven days to areas where there is greater activity.

Make sure all bait stations are secure and cannot be accessed by non-target species such as birds, dogs, cats and children. Collect any dead rodents daily and dispose of immediately before they can be picked up by birds, foxes or other carrion feeders. It is likely that only a few dead bodies may be found, as rats will generally return to their burrows to die. Read product labels for full disposal instructions.

Keep records of where bait has been placed and the products used. PelGar can provide baiting charts and record sheets free of charge. This will help track bait usage and also form part of farm assurance records.

Depending on the size of the infestation, the consumption of bait should decline after ten to 14 days. This is a sign that the baiting is working and rats are dying. Keep bait points topped up until no more bait is taken and no further activity is noticed. At the end of a campaign, empty all bait stations and dispose of soiled bait safely. Leave the stations in situ so they will be ready for the next baiting programme.





## Step 5: Stop new rats coming in

In winter, new rats will soon fill the gap left by the population that has been eradicated. Continue to tidy and protect food stores, seal the bottom of wooden doors with metal strips and try to minimise fresh water sources.



Entry holes and broken pipes are key to fix

## Step 6: Remain vigilant

Monitor activity at all times and start a new campaign as soon as new immigrant rodents are seen. By following these steps farmers can wipe out infestations on their farms and stop the damage rodents cause.

The PelGar 'Six Steps to Successful Rodent Control' is available in a booklet, in a practical ten minute DVD and on the internet at [www.getthatrat.com](http://www.getthatrat.com).

## PelGar Support

PelGar International is committed to producing some of the most effective pest control products on the market. PelGar is also committed to educate those in the supply chain, from sales staff through to end user.

This guide has been designed to help train and educate those involved in the provision of rodenticides, in order to develop their knowledge on rodents and their control, so they in turn can give the best advice to their customers. This process helps to ensure that the products are used to their optimum, facilitating fast and effective pest control both in the UK and overseas.

Other guides and literature available from PelGar include:



*PelGar Product Catalogue* - a complete guide to our UK product portfolio, the catalogue provides information on the broad range of rodenticides and insecticides available from PelGar International.



*Rat & Mouse Control* - an overview of the best products and PelGar's six point plan to help ensure successful rodent control.

*Red-Mite Control* - an overview of the problem, where red-mite may come from, and the best products and practices to follow to get on top of an infestation.



*Bluetongue - Midge Control* - an overview of the problem, issues facing the industry, and an integrated plan to help keep midges away.

*Fly Control* - an overview of PelGar's general fly control products including the highly effective, ready-for-use Vulcan P RFU.





PelGar International is a founder member of the  
Campaign for Responsible Rodenticide Use (CRRU).  
Visit [www.thinkwildlife.org.uk](http://www.thinkwildlife.org.uk).



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