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THE MAGAZINE FOR THE PEST CONTROL INDUSTRY

ISSUE 137

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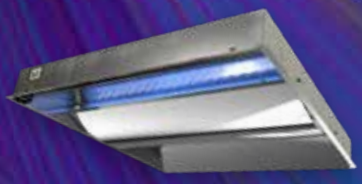

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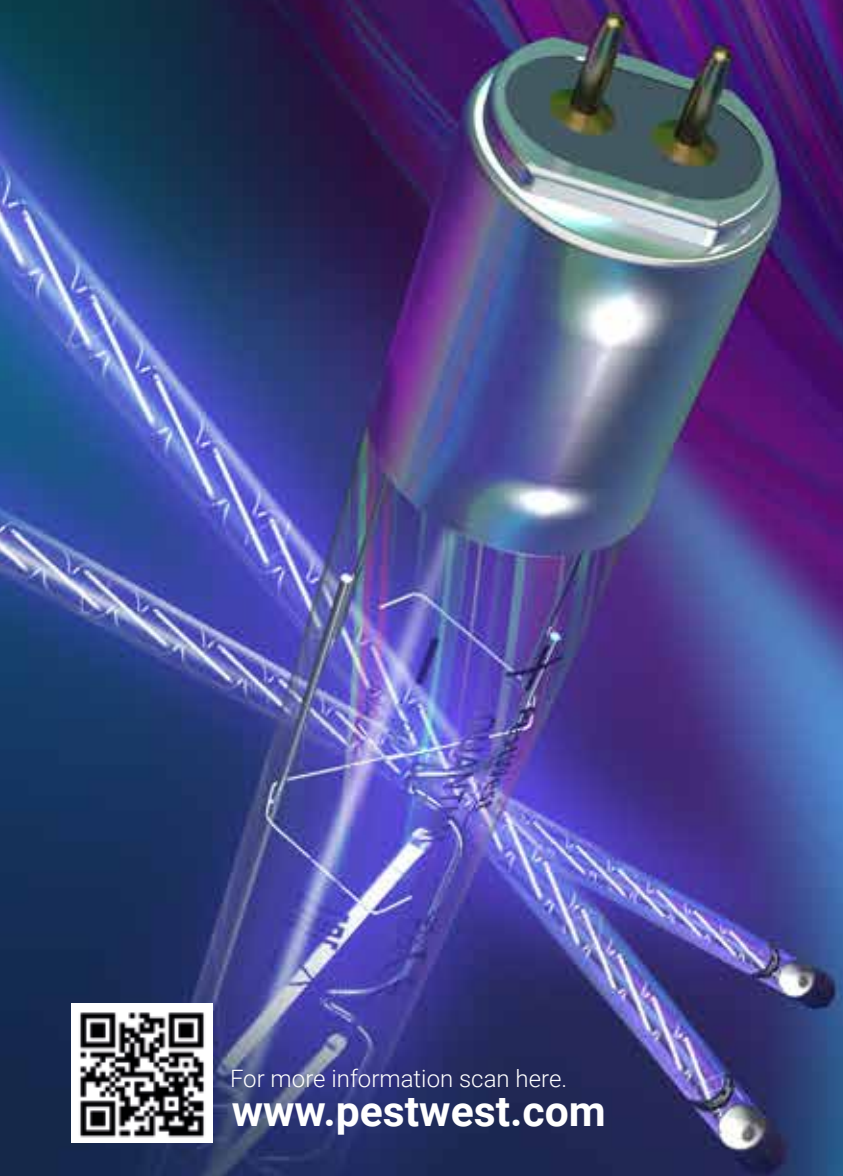

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Confidence in Fly Control

ISSUE 137

PCN
PEST CONTROL NEWS®

Bitesize...

Insecticide resistance in public health pest control 06

Insecticide resistance in insects is a growing topic. PCN talks about how to overcome it.

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New research into everyday challenges in pest management

Hannah Fair, a social scientist at the University of Oxford, is starting a new project exploring changes and challenges in professional pest management.

She's interested in talking to pest management professionals about their everyday working practices, their routes into the industry, challenges they face, and how they imagine the future of pest control.

She's keen to interview people working in a wide range of settings, from sole contractors, to SME owners and employees, to technicians working for large servicing companies.

She hopes this research can challenge common public misconceptions about pest control and provide useful data for the professional pest management industry. If you have any questions about the research, are interested in being interviewed or are happy for Hannah to join you on the job for a day to get a better sense of how pest control really works, drop her an email on **hannah.fair@ouce.ox.ac.uk**

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envu™ Professional Pest Management

Envu Collaborate on St Helens Island Conservation Project

Problem pests impact every environment. In addition to potential problems for public health or profit in domestic and commercial premises, are the issues that pests can cause in the wider landscape, where control is also crucial to protect environmentally sensitive areas and the species that depend on them for their survival.

Nestling 28 miles off the west coast of Cornwall is St Helens, a 26-hectare uninhabited island that forms part of the archipelago of the Isles of Scilly.

St Helens is of important environmental significance, providing a vital breeding ground for seabirds including Razorbills, Guillemots and Fulmars. Significantly, the island is home to growing numbers of Manx Shearwaters and a small colony of Puffins.

But it's not all plain sailing, as the island's seabird population is under threat as nests, chicks and even adult birds themselves fall prey to one of our most common pests, Rattus Norvegicus or the common rat.

Help is on hand however, as Envu has been working with the Isles of Scilly Wildlife Trust and the Royal Society for the Protection of Birds (RSPB) to help eradicate the population of rats from St Helens.

Richard Faulkner, Envu National Account Manager and Technical Manager for UK & Ireland explains, "The ground nesting bird population on St Helens has experienced a decline in population of almost 20% in the last 5 years. The Isles of Scilly Wildlife Trust and RSPB have both said that the removal of rats will help ground nesting bird populations, and have called for more action to enhance, preserve and restore habitats."

The island of St Helens is an environmentally sensitive area, as a vital nesting site for rare bird species. "To preserve the breeding ground, the goal is to eradicate the common rat population from the island while ensuring no detrimental effect to the environment or non-target species. In turn, this will prevent the predation of the eggs and chicks of ground nesting bird populations, helping to restore, enhance and protect the seabirds and their habitat."

Understanding the environment and unique challenges of the sensitive site has meant exceptional care in selecting products and delivery methods aligned with the goal of conservation and habitat protection. Having visited the island with Envu UK & Ireland's Head of Marketing Tim Peeling in October 2023, Richard Faulkner planned to start the project a month later.

"We anticipate that the treatment plan will run from November to the end of Feb / beginning of March 2024. The project will start with a monitoring phase to assess the rat population and later the monitoring product will be replaced with Cholecalciferol based Harmonix Rodent Paste, which is the best option for use in open areas and is a product that's not bioaccumulative, meaning there's no risk to non-target species."

This project is unique because it is the first time that a Cholecalciferol rodenticide (Harmonix Rodent Paste) has been used to carry out an island rat eradication programme in the UK or Europe.

"This is a fantastic opportunity both for me personally and as a member of the Envu team, to support and be a part of an environmental conservation project to protect our native wildlife. Envu is dedicated to advancing healthy environments for everyone, everywhere."

The St Helens conservation project is another example of the importance of environmental responsibility and utilises Envu's vast product knowledge and awareness of conservation issues to protect our world for the future.

Changes for farmers, gamekeepers & pest control businesses in new rodenticide stewardship report

In readiness for all anticoagulant rodenticide purchases being restricted July onwards to their use inside and around buildings only, the latest UK Rodenticide Stewardship annual report includes for the first time an explanation specific to rodent pest control of what constitutes a 'building'.

Summarised from guidance in the report, this means a permanent enclosed structure with foundations, constructed from wood, brick, concrete or metal that provides protection from the elements and minimises access by non-target species that might otherwise consume rodenticide baits placed inside. Temporary or easily moved structures are not generally considered to be buildings.

From 4 July specifically, none of the five second generation anticoagulant rodenticides (SGARs) are allowed to be bought for use in open areas or waste dumps. The five active ingredients – brodifacoum, bromadiolone, difenacoum, difethiolone and flocoumafen – are sold under numerous brand names. Announced in June 2023, this restriction is designed to strengthen rodenticide stewardship and lead to reducing SGAR contamination in barns owls, the sentinel species for non-target wildlife.

In response to the report, the HSE-led Government Oversight Group (GOG) to which stewardship operator the Campaign for Responsible Rodenticide Use UK (CRRU) is accountable acknowledges that commitments made at the 2016 outset have been fulfilled. It confirms that UK Rodenticide Stewardship, still under review by the GOG, is considered by government to be 'fit for purpose'.

Ongoing scrutiny also covers something of which the operator is acutely aware that there have been no reductions in any of the key environmental criteria. Four additional working groups, each containing government and CRRU representatives, have been set up to review rodenticide sales data, residues in wildlife, application of best practice and anticoagulant resistance. Another major change covered by the report is that from January 2026, all buyers and users of professional rodenticide products must hold an approved training certificate and, if this is more than five years old, membership of a stewardship-specific Continuing Professional Development (CPD) scheme. For the first time, this means farmers, gamekeepers and pest control technicians will have to be equally qualified.

Among results identified by the report, stewardship's training function has now issued 41,000 qualification certificates to pest control technicians, gamekeepers and farmers. In the past year alone, downloads of CPD materials have increased by 40% to 29,000 items, and a video produced with the Game and Wildlife Conservation Trust, for example, had 15,000 viewings.

Point-of-sale audits of 661 premises found 1% failures, 17% qualified passes with only minor corrections, and 83% outright passes. Over the past three years, 37% of farmers report attending stewardship training or seminars, up from 24% when last assessed in 2020. Farmer awareness of CRRU increased markedly from 20% in 2020 to 74% last year, on a par with gamekeepers (75%) and closing on pest control technicians (93%).

The report is available at www.thinkwildlife.org/downloads.

THINK WILDLIFE
Campaign for Responsible Rodenticide Use

Insecticide resistance in public health pest control – how to overcome it

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Insecticide resistance in insects is a growing topic and not just something fueled by recent reported bedbug cases and trends in the media. Within the pest management industry our tried, tested and staple products need to change with the times in terms of both resistance and further pressures due to restrictions placed on chemicals.

Clarity

When we talk about resistance, we are generally referring to genetic traits. These genetic traits are passed down from generation to generation- they are inherited. The definition of from the Insecticide Resistance Action Committee (IRAC) 'a heritable change in the sensitivity of a pest population that is reflected in the repeated failure of a product to achieve the expected level of control when used according to the label recommendation for that pest species'. This can be down to inheritance and also random mutations. With insects as with many other creatures, a sense of survival (and therefore passing on one's genes) is a primary objective. Therefore, we see survival of the fittest within a population. If individuals within that population have a beneficial genetic trait – it's simple – they survive, often outliving other individuals without that genetic trait.

Other words that are used can be tolerance and immunity. This can be confusing. These should not be confused with resistance. Tolerance, an enhanced natural / inherent ability to survive an insecticide treatment, perhaps due to size, thickness of the body or ability to break down products. Immunity, protection from disease for example, which can be fostered or given.

It is in their DNA...

That's right, it is the changes, the alterations, the mutations within the deoxyribonucleic acid (DNA), the double helix set of coded instructions for the pattern of life. The genetic resistance mechanisms are also permanent – insects are born with it rather than it occurring during their lifetime. The most common resistance, which is called 'knock-down resistance' or 'kdr', can be seen currently in bedbugs *(Cimex lectularius)* and houseflies *(Musca domestica)*. We tend to see insecticide resistance in species that can breed quickly and develop quickly. In the case of bedbugs, they have, as a species, overcome many evolutionary hurdles. They and their close ancestors have been roaming around for millennia, born survivors clearly showing genetic adaptation and definitely survival of the fittest.

Types of resistance

There are several types of resistance, some of which are more common than others. Let's start with the most common types.

Altered target site resistance: The insecticide active molecule needs to bind with a target site within the insect. In altered target site resistance, the target site is changed – the active molecule cannot bind – therefore is ineffective. The noticeable practical effect is that insects, especially houseflies, are not 'knocked down' and killed following insecticide spray treatments. This is 'knock-down resistance' or 'kdr'.

Metabolic resistance: Insects possess a variety of enzymes, which in mutated individuals or populations work to detoxify (actively break down and destroy) the toxin (the insecticide active) faster than the active can take effect. Therefore, the insecticide doesn't work, or can take longer to work.

Penetration resistance: The outer chitin layer of the insect's exoskeleton (upper epidermis) is thicker than usual in individuals with this mutation. This can either slow down or inhibit the insecticide molecule even reaching the target site in the insect.

Behavioral resistance: It can be hard to imagine that insects have the capacity to alter their normal behaviour. However, in behaviorally resistant individuals avoidance is a classic example. Triggered again by their genetics. It has been seen during research trials that bedbugs can avoid insecticide treated surfaces. It is worthwhile to remember that not all bedbugs have this behaviour.

Resistance management

Now we have the knowledge, how does this apply in a real world? Integrated pest management (IPM) will always feature. However, suspected resistance should not be the first go to explanation for a failed treatment. We should investigate other factors first, once those are ruled out, we can dig a little deeper. Treatment failure may be due to other factors:

Many of these points can be avoided by following the label correctly for the chosen product. Resistance management is usually mentioned on the insecticide labels. For example, limiting usage to a certain number of times per year, or rotation of active substance with a different mode-of-action. With greater restrictions and loss of insecticides this is more of a challenge. Key ingredients to look out for on labels can help. For example, PBO (piperonyl butoxide) is a synergist that is added to boost the effectiveness of (usually) synthetic pyrethroids and pyrethrum-based chemicals. PBO enhances the action, therefore making the product more effective for suspected metabolic resistance cases. PBO stops some of the enzymes trying to break down the insecticide – therefore, increasing effectiveness.

Other active ingredients to look out for are insect growth regulators (IGR's). IGR's can typically take longer to work. The function of IGR's differs from synthetic pyrethroid group chemicals such as deltamethrin, alphacypermethrin, tetramethrin, cypermethrin. Instead of working on sodium channels at the nerve fibre, IGR's affect the endocrine (hormone) system of insects. The insect cannot develop properly, therefore cannot reach fertile adulthood, ergo cannot proliferate. Examples of IGR actives are S-Methoprene, pyriproxyfen – there are others (not all with UK authorisation).

The same IGR can affect life stages of the same species in different ways. For example, an adult flea treated with an IGR will survive, but thereafter couldn't lay viable eggs. The larval form could not develop into an adult and may stay in the larvae stage until they perish. Another very valid point that if we were to use an IGR on a textile pest, we may prolong the larval feeding stage and potentially facilitate more damage. Therefore, IGRs are not normally recommended for textile pests! Physical mode of action products can also be used very effectively, such as Polyalkyleneoxide modified heptamethyltrisiloxane, providing an immobilisation action.

To add to this, diatomaceous earth-based products are also a viable treatment. Again, they can take longer to work but as with the other physical action products, there are no issues with resistance.

Treatments using heat are also particularly effective on all life cycle stages of insects, again resistance is not an issue. Migration behaviour maybe (if not used correctly) but true genetic resistance is a no. High heat, low pressure dry steam treatments are ideal and thermally shock the insects rather than cook them. Heat exchangers/generators are used for tented and structural heat treatments, codes of practice should be followed with these treatments too. Heat treatments often use an insecticide barrier around the treatment area, countering insect migrations.

Is there a test for resistance?

There are tests that can be carried out; unfortunately, not all are viable for general use. There is a very simple test for resistance that can be used for bedbugs. A similar example is published in the proceedings of the International Conference of Urban Pests (ICUP), by confining 10 bedbugs to a vial, and exposing them to the insecticide, leave for an hour and see how many are still alive or not after the hour has elapsed. This is a simple and effective gauge.

Other tests are possible, but none as simple as the test above. For example, electron microscopes can be used to study cuticle thickness, however, would likely be cost prohibitive.

Is resistance in all insect pests?

As mentioned, we tend to see resistance to insecticides occurring in houseflies and bedbugs but what about other pest species? The treatments for cockroaches and ants (another two key groups in public health) are often treated in a different way – using baits. The options for baits are highly specific, allowing for increased concentration of active. There is currently a good choice of products and actives and therefore a variety of modes of action (this is a key point in resistance management). Edible baits for insects have made huge technological strides in the last few decades since their original introduction, changing the treatment procedures, making them highly effective and lower risk. In summary, potential resistance to insect baits can be more effectively and proactively managed due to the choices available both in terms of product, mode of action and therefore rotation options.

Current best practice

It's incredibly important to note that whilst we know resistance is there, it is not everywhere. Current treatment protocols when we think we are dealing with potentially resistant insects would be:

- **Follow any codes of best practice.**
- **Read and follow the product labels.**
- **Keep up to date with pest industry publications, workshops and update/ refresher courses can help keep you informed.**
- **Use other methods alongside insecticides, heat, physical insecticides, PBO and IGR's.**
- **Seek help and advice if you need to.**
- **Think proactively, rotation of actives with different modes of action as far as possible helps to manage resistance before it becomes an issue.**

Managing pyrethroid resistance in bedbugs:

Options include:

- Rotate treatments with insecticides that have a different mode of action...
- Use IGRs
- Immobilisation sprays
- Diatomaceous Earth
- Steam treatments
- Heat treatments
- Freezing treatments
- Follow the dilution and application rates on product labels

Managing pyrethroid resistance in houseflies:

Options include:

- UV light fly traps
- Hygiene
- Proofing
- Manure and waste management
- Follow the label regarding treatment frequency with pyrethroid insecticides
- Follow the dilution and application rates on product labels
- Rotate treatments with insecticides that have a different mode of action e.g. paint-on baits with a non-pyrethroid active ingredient.

Dr Alan Buckle, Visiting Research Fellow at the University of Reading and Chair of the Campaign for Responsible Rodenticde Use (CRRU UK) reflects with PCN on over 50 years in pest management.

Alan retires from his CRRU role at the end of April 2024, with a stellar career that has shaped the pest management industry for just over half a century. Many of our readers will be familiar with Alan as the Chair and driving force of the Campaign for Responsible Rodenticide Use (CRRU UK), the industry stewardship regime that has preserved the use of anticoagulant rodenticides when they were under threat of withdrawal. However, while the contribution of CRRU has been and continues to be hugely significant, there is much more to thank Alan for.

Alan was in demand to give courses about rodents, rodent control and testing rodenticides. Here he is (looking rather hot!) teaching staff of the Indonesian Directorate of Crop Protection in Pekalongan, Central Java, about lab and field testing.

Hinting at some early highlights, to whet one's appetite to read on, Alan was instrumental in the development of anticoagulants in the first place! We wouldn't have certain anticoagulant active ingredients and formulations without the work of him and his co-workers and it is almost certain these products would not remain without the efforts of CRRU UK.

A personal highlight and note of appreciation from PCN (our Technical Editor is an entomologist at heart), is to recognise Alan's work in developing key insecticides in public health pest management. More on this later...

Early research

Having graduated from Royal Holloway College, University of London, with a 1st class honours degree in Zoology, Alan completed a PhD there on the 'Insect epifauna of British wild small mammals', tracking marked fleas moving between Wood mice to see who was living with who. Alan's contributions to pest management began as early as 1973, when he started research at Aston University (Birmingham, UK) that led to the development and commercialisation of a novel technology for mouse control.

Alan met Mary Eastaugh at university. They married in 1974 and celebrate their golden wedding anniversary in July this year. They have two daughters, Laura and Karen, and in spite of Alan's many and often long absences travelling abroad, Mary ably juggled being a mother to the girls with a successful career as a maths teacher.

Development of key anticoagulants and formulations
From Birmingham to the rice of fields of Malaysia...where Alan worked on the control of (*Rattus argentiventer)* the 'Rice field rat'. Alan owes his start to Fred Rowe, who was the house mouse specialist in the UK Ministry of Agriculture and his mentor in Malaysia and the UK for ten years.

Seconded to the Malaysian Ministry of Agriculture, his work included damage assessment and damage surveys, field efficacy tests, rodenticide resistance, developing wax blocks and reduced baiting methods for brodifacoum baits, leading to the pulsed baiting concept. On departure for Malaysia, Alan remembers instructions from the project's boss, David Drummond, pioneer of anticoagulant resistance work in the UK. David said, "If you ever do a project that involves catching a rat and letting it go again, I'll have you back home before you


Photo Credit: Frances McKim

know what's hit you." David was one of the 'don't study them get rid of them' school, that is so different to current thinking.

Malaysia also involved a cobra bite and stay in rural hospital. Alan remembers two other 'patients' in the ward. One was a cat that slept on the bed opposite the whole day, while in the next bed was a communist terrorist, hand-cuffed to the bed-frame and guarded by a police officer with a shotgun! Luckily the bite responded quickly to anti-venom but resulted in a tricky phone call to Mary back on Penang Island.

I think many of us take wax blocks and 'pulsed baiting' for granted – now we know some of the history!

Now for some key points regarding work on anticoagulants and their formulations

- While at MAFF (Ministry of Agriculture, Fisheries and Food) Welshpool laboratory in the early 80's, Alan undertook the first field trials of pulsed baiting with brodifacoum and flocoumafen.

- For many years Alan worked closely with Malcolm Hadler of Sorex, the 'grandfather of the SGARs', to develop new active substances, including flocoumafen, and to optimise effective SGAR uses. https://digitalcommons.unl.edu/vpc15/36/

- From MAFF to ICI...where Alan devised and managed projects for the development of products containing difenacoum and brodifacoum and use in both public health and crop protection. This included brand names / formulations that will be familiar to many PCN readers – Klerat, Talon and Ratak pellets and wax blocks. With his ICI colleague in the US, Dale Kaukeinen, Alan also did all the early lab and field work on the effectiveness of Bitrex as a human taste deterrent. This has now become standard safety feature for rat baits across the industry worldwide.

Insecticides

While the Global Research and Development Manager at ICI, Alan was responsible for R&D of all formulations of the insecticide active ingredients permethrin, cypermethrin, lambda-cyhalothrin and pirimiphos-methyl. Bringing his expertise to Syngenta in the early 2000's, Alan led projects on Vector and Professional Pest Management insecticides under the brand name 'Icon', which included microencapsulated formulations of lambda-cyhalothrin, wettable powder formulations and treated malaria bednets

Travels/international reach

With the move from Birmingham to Malaysia already mentioned, Alan undertook vertebrate pest management projects in South-East Asia and has directed further research in many countries around the world. Both at ICI and as part of his later work at Alan Buckle Consulting Ltd, he has consulted on management of vertebrate alien species on islands of high conservation status including projects on Madeira and neighbouring islands with his friend Frank Zino, and in the Caribbean, Mauritius, Galapogos, Africa and the UK. As part of an industrial role, there have also been projects on barn owls as a biological control of rats in oil palm.


Photo credit: Andy Swash

Off-shore from Madeira looking for one of Europe's rarest seabirds, Zino's Petrel *(Pterodroma madeira)*, seen here with (from the left) Dr Manuel Biscoito, Director of the Museum of Funchal, Dr Frank Zino whose father Alec rediscovered the petrel after it had been considered extinct for half a century and after whom the species was named, Dr Richard Grimmett, then of BirdLife International, and Gill Swash, wildlife photographer and natural historian.

All the travel gave Alan a taste for exotic foods. This unfortunately led to cholera after a sushi sea-urchin dinner in Manila. The flight to Bangkok that night was spent in the loo and ended on a stretcher and an ambulance ride. The last he remembered on waking three days later in intensive care was an A&E doctor saying 'if we don't get this guy's blood pressure up we're going to lose him!". The career nearly ended there!

Working early in his career for the Malaysian Department of Agriculture on the control of rats in rice fields.

Rodenticide resistance

Alan's experience with anticoagulant resistances starts in the late 1970's when he established baseline resistance in the rice field rat. It then progressed to field trials of novel rodenticides to control resistant rats in Welshpool. His greatest contributions to knowledge of anticoagulant resistance, in Norway rats (*Rattus norvegicus)* and house mice (*Mus musculus)* came via his roles as Visiting Research Fellow at the University of Reading, Chair and founder member of the Rodenticide Resistance Action Group and Chair and founder member of the Rodenticide Resistance Action Committee. Alan's research, done with his long-time friend and colleague Dr Colin Prescott, encompassed anticoagulant resistance including susceptibility of different rat and mouse resistance mutations to different anticoagulants and geographical distributions of resistance genotypes.

PCN recommends readers to consult RRAG, RRAC and CRRU websites for the most up-to-date information regarding anticoagulant resistance in the UK

https://www.rrag.uk/

https://rrac.info/

https://www.thinkwildlife.org/anticoagulant-resistance-project/

https://www.thinkwildlife.org/download/crru-resistance-report-2022/

Particularly relevant is the 2020 review, co-authored by Alan, entitled 'Anticoagulant rodenticides and resistance development in rodent pest species – A comprehensive review' **https://www.sciencedirect.com/science/article/abs/pii/S0022474X20302435**

Industry stewardship

When Alan retires from his CRRU role, he will have held the position of Chairman for over 20 years.

Alan doesn't take credit for starting CRRU. In fact, it began when a small group of like-minded industry people, including the late Jonathan Peck of Killgerm and Ian Pepper of Rentokil Initial, decided something needed to be done about wildlife exposure to SGARs, which was becoming an inceasing issue. Alan was soon appointed as Chairman and, as they say, 'the rest is history'. The UK rodenticide stewardship regime began 10 years later and is now the single biggest stewardship scheme for pest control products ever in the UK. All of this has been achieved on a voluntary basis and under Alan's guidance.
How did stewardship begin? Government agencies responsible for the regulation of rodenticides raised concern that many species of wildlife, such as barn owls, kestrels and red kites, were and are being accidentally exposed to these products. These agencies called for better stewardship of rodenticides to prevent wildlife exposure before they could be authorised for use outdoors.

The Campaign for Responsible Rodenticide Use (CRRU) remains a response to that call. Under the banner "Think Wildlife" CRRU promotes best practice and responsible rodent control, thereby protecting wildlife from rodenticide exposure.

Development of the UK rodenticide stewardship regime

The development of a stewardship framework was not easy, taking three years of hardwork. There were the conflicting positions and interests of different user groups and the requirements of government to reconcile. Some stakeholders walked out but later came back. Alan led the CRRU team trying to pull it all together and there were countless meetings with user-group representatives and government, including a meeting with the minister responsible for HSE. Three different proposals went from CRRU to government. Rupert Broome, who was beside Alan thoughout, remembers the first was received with the response 'be more ambitious' and the second with 'almost there'. Finally, a third set of proposals was agreed with HSE and accepted to meet its 'High Level Principles' (https://www.hse.gov.uk/biocides/rodenticides.htm) and stewardship could begin.

Implementation of the UK rodenticide stewardship regime

Training and certification

One of stewardship"s most important requirements is that all who buy professional rodenticide products must show proof of competence at the point of sale.

Best practice

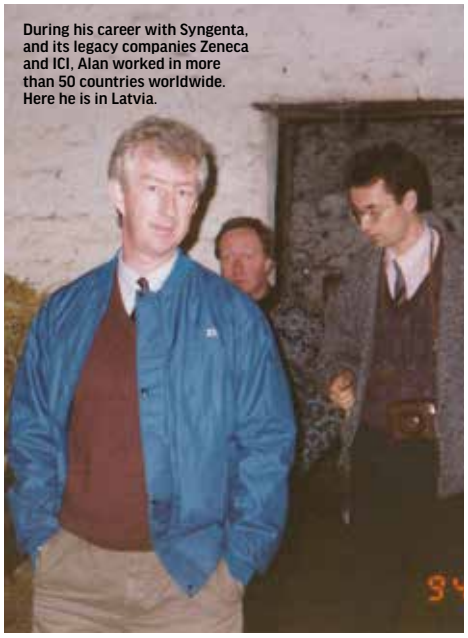
Many aspects of rodenticide application practice are now supported by published CRRU guidelines, many of which Alan has written or co-written. The most important of these being the CRRU Code of Best Practice, a revision of which was produced in July 2021.

Monitoring

A framework of monitoring has also been introduced covering all aspects of the regime, including residues in wildlife, anticoagulant resistance, barn owl breeding and understanding and adoption of best practice.

Strengthening the regime

However, after seven years of the regime and with environmental targets still unmet, it became clear to Alan, CRRU directors and other CRRU stakeholders that changes were required. So a series of strengthening measures is now being implemented with two main objectives: to reduce wildlife exposure to rodenticides and to keep SGARs available



During his career with Syngenta, and its legacy companies Zeneca and ICI, Alan worked in more than 50 countries worldwide. Here he is in Latvia.

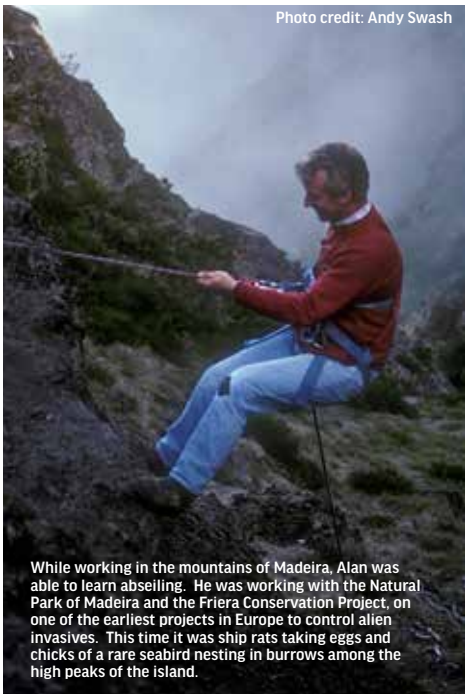


Photo credit: Andy Swash

While working in the mountains of Madeira, Alan was able to learn abseiling. He was working with the Natural Park of Madeira and the Friera Conservation Project, on one of the earliest projects in Europe to control alien invasives. This time it was ship rats taking eggs and chicks of a rare seabird nesting in burrows among the high peaks of the island.

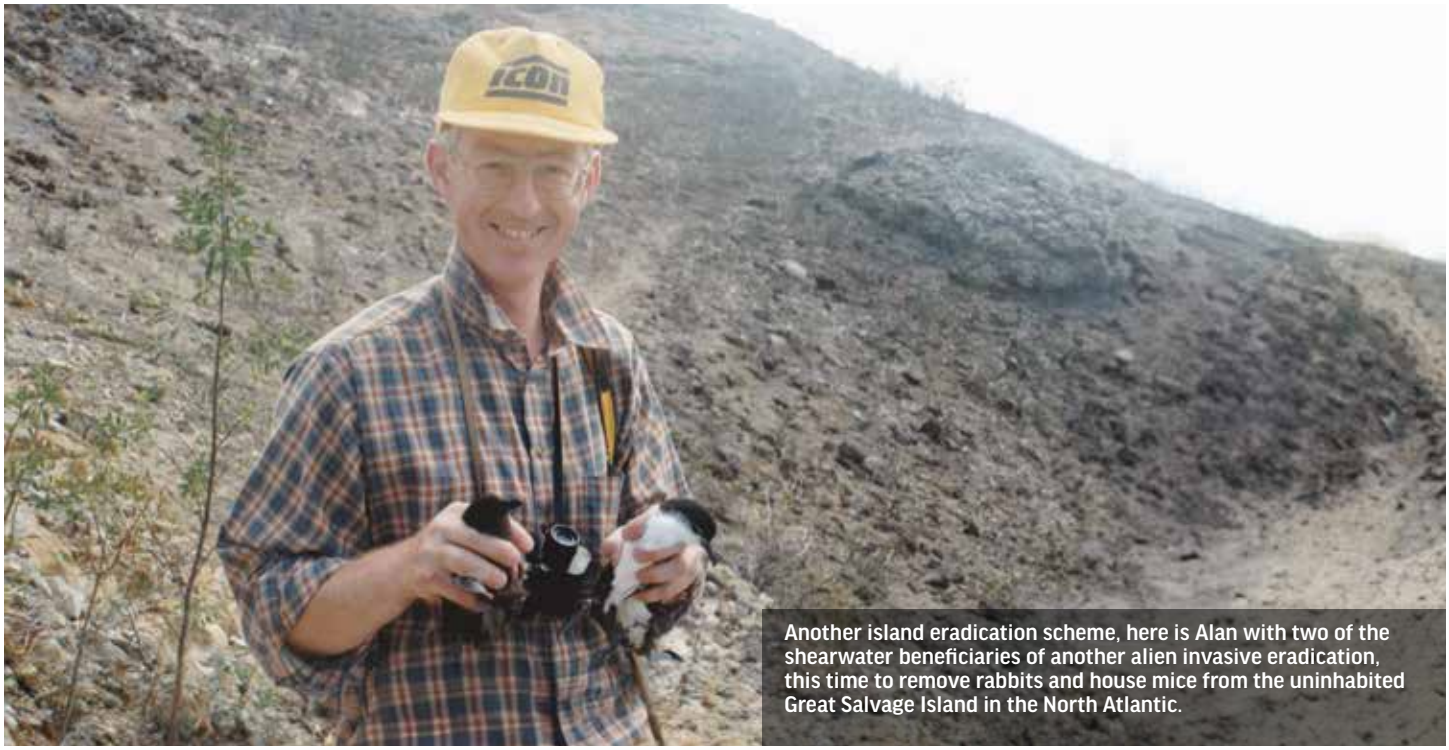
to all user groups in the essential use scenario – 'in and around buildlings'. One measure to control levels of anticoagulant residues in barn owls, is that sales of products containing bromadiolone and difenacoum for use in open areas and at waste dumps will cease on 4 July 2024. These products purchased on or before that date will be authorised for use in open areas and waste dumps until 31 December 2024. After that, it will be illegal to use any SGAR product to treat a rodent infestation not associated with a building. The CRRU Code of Best Practice offers a range of effective methods for rodent management away from buildings, including elimination of harbourage, food and water; lethal non-anticoagulant baits; and trapping, shooting and dogs. Adding further strength to stewardship - from January 2026 onwards, all buyers and users of professional SGAR products must hold either a stewardship-specific training certificate less than five years old, or an older one with proof of membership of a stewardship-specific Continuing Professional Development (CPD) scheme. As five-year certificate expiry dates approach, holders can either repeat the training and requalify, or join a CPD scheme. Most recently, further rigour has been applied to training and certification with a requirement that CRRU-approved courses are Ofqual regulated.

This complex and nationally-implemented stewardship regime is entirely operated by voluntary contribution of resources from the CRRU stakeholder organisations and member companies. Pest Control News and Alan offer grateful thanks to those organisations, and to the individuals involved, and on behalf of all whose livelihoods depend on our continued ability to conduct effective rodent pest management to protect human and animal health and hygiene.

Finally, what with cobras and cholera, you could be forgiven for thinking that Alan is accident prone! But there's more! A few years ago he contracted leptospirosis when he scratched his arm working in a garden compost heap that had months earlier been home to a rat. It is a salutary story that Alan stood in front of three NHS doctors, including one in A&E, and told them what he had. All said it was 'flu and sent him home. Finally, late one night Mary thought she was going to lose him and went to a GP she knew. Antibiotics were immediately prescribed and acquired at an all-night pharmacy. Recovery was very quick after that and blood tests at Porton Down eventually confirmed lepto!

Retirement plans

With more time available, Alan most of all looks forward to spending time with his wife, their two daughters and their families, including five grandchildren. He is a keen walker and lucky to have beautiful walks in the South Downs from his doorstep on the West Sussex/ Hampshire border. He spends time in north Pembrokeshire walking the coastal path and watching birds on the off-shore islands. Alan volunteers for about every bird survey going in his local area run by the British Trust for Ornithology and the Sussex Wildlife Trust. At home nothing gives him more pleasure in the garden than growing apples for cider-making and in the kitchen trying to recreate the Malaysian curries he and Mary enjoyed so long ago.



Another island eradication scheme, here is Alan with two of the shearwater beneficiaries of another alien invasive eradication, this time to remove rabbits and house mice from the uninhabited Great Salvage Island in the North Atlantic.

Evaluating Marketing ROI: Metrics That Matter for Pest Control Professionals

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In the highly competitive pest control industry, effective marketing is crucial for attracting and retaining customers. As pest control professionals navigate the digital landscape, it becomes imperative to measure the success of marketing efforts accurately. Evaluating the return on investment (ROI) is essential for optimising strategies and ensuring that resources are allocated wisely.

In this article, we will delve into key performance indicators (KPIs) that pest control businesses should track to gauge marketing success, explore tools and techniques for measuring ROI, and provide insights into adjusting marketing strategies based on performance metrics.

Key Performance Indicators (KPIs) for Pest Control Marketing

Lead Generation:

- **Website Traffic:** Monitor the number of visitors to your website to assess the effectiveness of online marketing efforts.
- **Form Submissions:** Track the number of inquiries or quote requests received through online forms to measure lead generation.

Conversion Rates:

- **Conversion Rate from Leads to Customers:** Evaluate how many leads are converted into paying customers, providing insights into the efficiency of your sales process.
- **Customer Acquisition Cost (CAC):** Determine the cost associated with acquiring a new customer, considering marketing expenses and resources.

Customer Retention:

- **Customer Churn Rate**: Measure the percentage of customers lost over a specific period, highlighting the need for customer retention strategies. Do you have less customers than you had this time last year? Why is this happening?
- **Customer Lifetime Value (CLV):** Calculate the total revenue a customer is expected to generate throughout their engagement with your business, helping assess long-term profitability.

Online Presence:

- **Search Engine Rankings:** Track your website's ranking on search engines for relevant keywords to evaluate the effectiveness of your SEO efforts.
- **Social Media Engagement:** Monitor likes, shares, comments, and followers on social media platforms to gauge the impact of your social media marketing.

Tools and Techniques for Measuring Marketing ROI

Google Analytics:
Leverage Google Analytics to track website traffic, user behaviour, and conversions, providing valuable insights into the effectiveness of your online marketing efforts.

Customer Relationship Management (CRM) Systems:
Utilise CRM systems to track leads, monitor customer interactions, and assess the entire customer journey, enabling better understanding and management of customer relationships.

Attribution Modelling:
Implement attribution models to analyse the contribution of each marketing channel to lead generation and conversions, helping allocate resources more effectively.

Marketing Automation Platforms:
Employ marketing automation tools to streamline marketing campaigns, track customer interactions, and nurture leads through the sales funnel, improving overall efficiency.

Adjusting Strategies Based on Performance Metrics

Data-Driven Decision-Making:
Use insights from KPIs to make informed decisions about allocating resources, optimising marketing channels, and refining targeting strategies.

Campaign Optimisation:
Continuously monitor and adjust individual marketing campaigns based on performance metrics, reallocating budget and resources to those that yield the best results.

A/B Testing:
Conduct A/B testing on various elements of your marketing campaigns, such as ad copy, images, and landing pages, to identify what resonates best with your target audience.

Feedback and Adaptation:
Gather feedback from customers and analyse reviews to understand their preferences and pain points. Use this information to adapt marketing strategies and improve customer satisfaction.

Evaluating your marketing ROI is vital for the sustained success of pest control professionals in a competitive market. By focusing on key performance indicators, leveraging analytical tools, and continuously adapting strategies based on performance metrics, your business can ensure that it's marketing efforts yield the best possible results. In an ever-evolving landscape, the ability to measure, analyse, and optimise marketing ROI is a cornerstone for long-term success in the pest control industry.

Cockroaches: profiteers of climate change

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Cockroaches comprise an old, successful order of insects that have changed little since their emergence in the Upper Carboniferous period.

Thousands of species are widely distributed in tropical and subtropical zones worldwide. However, a few species were frequently introduced to Europe via global trade decades or even centuries ago, which could only establish under the consistently warm conditions found indoors. These mainly include the German cockroach *(Blattella germanica)*, the Oriental cockroach *(Blatta orientalis)* and the American cockroach *(Periplaneta americana)*. These species all present challenges indoors in our area, particularly in food production facilities, restaurants, dirty apartments, refugee camps and sewage systems.

These days, the German cockroach (*Blattella germanica*) occurs worldwide. Some reasons for their successful spread in human environments include their small size and their high reproductive capabilities within a short time. It is the most important cockroach pest globally, especially in Europe.

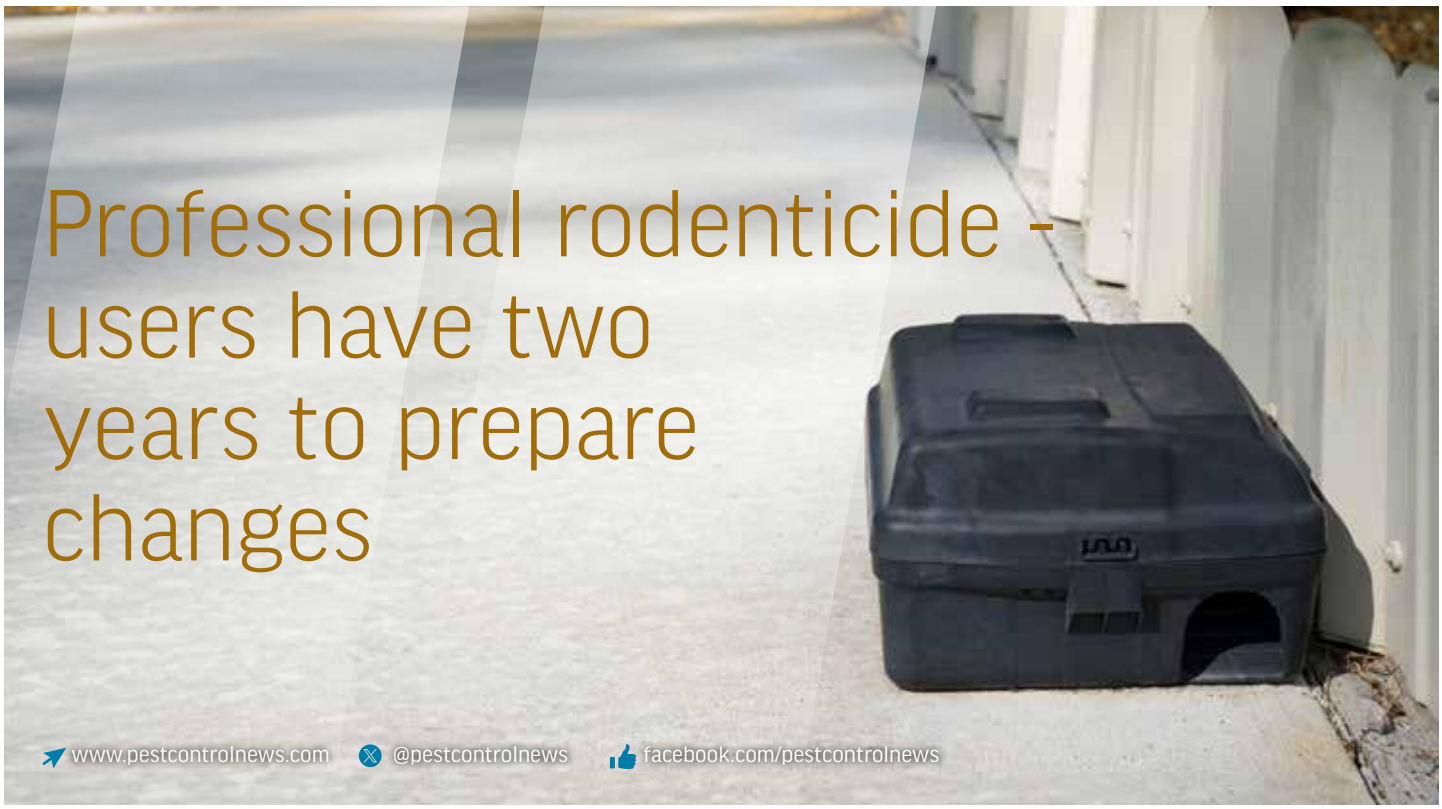
The Oriental cockroach *(Blatta orientalis)* is a strictly nocturnal species that prefers warm, humid areas like bakeries, breweries and farms with animal husbandry. However, Oriental cockroach individuals are relatively cold-tolerant compared to other synanthropic (associated with humans) cockroach species. In southern Europe, this species often lives outdoors around buildings during the summer and moves into houses in the winter. As a result of the warmer temperatures from global warming, these insects in central Europe are now starting to leave their harborages in hot, summer periods and spread outdoors to surrounding residential buildings above ground.

The American cockroach (*Periplaneta americana*), which presumably came from tropical African areas, has established itself in temperate zones within the past few decades – even in the sewage systems of urban areas –and often migrates into buildings.

This situation is currently changing with global warming, as it allows these cockroach pests to survive longer and reside outdoors in central European cities, at least in the warmer season (from spring to late fall) before they begin to enter houses again.

Temperatures in cities containing over 50,000 people are already 10-15 C higher than temperatures in the countryside1), also known as the urban heat island effect, which is intensified by global warming. This trend will presumably also allow new cockroach species from other continents to migrate to and survive in central Europe, such as the Turkestan cockroach (*Shelfordella lateralis*) and the Australasian cockroach (*Periplaneta Australasia*). This may result in increased demand for pest control professionals. This development will make controlling these pests more challenging for pest controllers as it's even more difficult to find cockroach harborages outdoors. It's also nearly impossible to treat an entire area with a single product that provides residual, long-lasting control. Thus, a reliable gel product that is carried by the insects themselves into the hidden harborages to be shared among nestmates is essential for handling this new challenge.

Professional rodenticide – users have two years to prepare changes



Professional rodenticide users have two years to prepare for changes
All three user groups of second generation anticoagulant rodenticides (SGARs) covered by the UK Rodenticide Stewardship Regime – pest controllers, gamekeepers and farmers – have two years to prepare for a significant change in access to such products.

Despite resistance from several farming organisations, the directors of stewardship regime operator, the Campaign for Responsible Rodenticide Use UK (CRRU), decided that change was essential for the regime to achieve its purpose [CRRU member companies here: **thinkwildlife.org/about-crru-uk/stakeholders**].

So from January 2026 onwards, all users of professional rodenticide products must hold either a stewardship-specific training certificate less than five years old, or an older one with proof of membership of a stewardship-specific Continuing Professional Development (CPD) scheme. As five-year certificate expiry dates approach, holders can either repeat the training and requalify, or join a CPD scheme.

At its 2016 inception, the regime's HSE-led Government Oversight Group (GOG) set the objective to reduce exposure of wildlife to rodenticides [Ref 1]. The sentinel measure of this is the incidence of SGAR residues in annual surveys of dead barn owls sent to the Predatory Bird Monitoring Scheme (pbms.ceh.ac.uk) by members of the public.

Every year, the main causes of death have been vehicle impact or starvation.

CRRU chairman Dr Alan Buckle points out that despite all three user groups making widespread advances including improved competence and best practice, greater understanding of the potential adverse impacts of rodenticides on wildlife, and ways to mitigate them, this target has not yet been met [Ref 2].

"The most recent headline is that a stubbornly static 80% of barn owls carry residues of one or more SGARs," he says. "These changes are designed to strengthen stewardship and protect essential uses of rodenticides for all professional user sectors, especially farmers, by meeting GOG environmental targets.

"Another important strengthening measure, announced in May 2023, was that from July 2024, none of the five SGARs available in the UK can be purchased for use in 'open areas' away from buildings. Clearly, this change makes it more important than ever to read rodenticide product labels carefully and make sure they can be applied legally in the intended locations."

Since January 2023, all stewardship-specific training and certification approved by CRRU has been regulated independently by Ofqual. All qualifying CPD schemes will also be CRRU-approved. Two are available already from BASIS PROMPT and BPCA Registered and more expected to follow during 2024.

Ref 1: hse.gov.uk/biocides/assets/docs/Rodenticides-Stewardship-Regime-GOG-rev-Feb2017.pdf

Ref 2: thinkwildlife.org/download/five-years-of-rodenticide-stewardship-2016-2020-report/?wpdmdl=18111&refresh=651fdec07901b1696587456

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THINK WILDLIFE
Campaign for Responsible Rodenticide Use

Bird licensing for 2024

A reminder to consult 2024 general licences for bird management

This is a reminder, for those involved in professional bird management, to ensure you have the latest copies of general licences before undertaking any lethal control of listed bird species. In fact, it's not just about having the latest copies, it's about following the licence requirements fully.

England

In England, the relevant general licences are available here
https://www.gov.uk/government/collections/general-licences-for-wildlife-management

The general licences regarding bird management have been reissued for 2024, continuing with the two-year validity rather than the historic lifespan of one year. They are valid from 1st January 2024 to 31st December 2025.

The licence most relevant to many pest controllers is the GL41 Wild birds: licence to kill or take for public health or safety. As a land owner, occupier or authorised person, use this general licence to kill or take certain wild birds to preserve public health or safety. Species listed are Canada goose, Branta Canadensis, Feral pigeon Columba livia, Jackdaw Corvus monedula, Monk parakeet Myiopsitta monachus.

Also note the following:
Wild birds: licence to kill or take to prevent serious damage (GL42)
Wild birds: licence to kill or take for conservation purposes (GL40)

Scotland

2024 bird general licences for Scotland are available
https://www.nature.scot/doc/general-licences-birds-2023-2024
They are valid from 1st January to 31st December 2024.
Key licences are:

GL01/2024 - To kill or take certain birds for the conservation of wild birds

GL02/2024 - To kill or take certain birds for the prevention of serious damage

GL03/2024 - To kill or take certain birds for the preservation of public health, public safety and preventing the spread of disease

Wales

Welsh general licences update:

Natural Resources Wales (NRW), published in December 2023 new general licences for the control of wild birds for the 2024 calendar year.

Following consultation with stakeholder bodies, NRW made some changes to the general licences allowing lethal control for 2024.

In particular, BoCC Wales 2022 highlighted a 25-year decline in magpie populations in Wales, placing them on the Amber list. As a species of conservation concern, Magpies are therefore not included as a target species on General Licence GL001 for the purpose of preventing serious damage to livestock or foodstuffs for livestock.

Other changes for 2024 are:

- **A recently notified SSSI, Scoveston Fort, is added to the list of SSSIs where the relevant general licences do not apply**
- **Cormorant, red kite, reed bunting and song thrush are no longer included as beneficiary species of GL004 (which allows the control of carrion crow for the purpose of conserving other wild bird species) Chaffinch, dunnock, garden warbler, Mediterranean gull and rook are added as beneficiary species of GL004.**

Key licences valid from 1st January 2024 - 31st December 2024 are:

GL002 – Preservation of public health
This general licence is for the purpose of preserving public health and preventing the spread of disease.

It authorises the killing or taking of feral pigeon. This includes damaging or destroying their nests and taking or destroying their eggs. It also authorises the use of any device (inside a building) for illuminating a target or any sighting device for

night shooting; the use of any form of artificial lighting or any mirror or other dazzling device; or of any handheld or hand propelled net (inside a building) to take birds whilst not in flight.

GL001 – Prevention of serious damage to crops and livestock
This general licence is for the purpose of preventing serious damage or spread of disease to livestock, foodstuffs for livestock, crops, vegetables or fruit. It authorises the killing or taking of Canada goose, carrion crow, jackdaw, feral pigeon and wood pigeon. This includes damaging or destroying their nests and taking or destroying their eggs. It also authorises the use of carrion crow and jackdaw as decoys in cage traps.

Northern Ireland

Licences are available for 2024.
https://www.daera-ni.gov.uk/articles/wildlife-licensing

Kill or take certain birds, including the taking, damaging or destruction of their eggs, or the disturbance of such a bird or the young of such a bird for the purpose of preserving public health or public safety
To kill or take certain birds TPG1

Kill or take certain birds, including the taking, damaging or destruction of their eggs, or the disturbance of such a bird or the young of such a bird for the purpose of preventing the spread of disease and preventing serious damage to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber and fisheries.
To kill or take certain birds TPG2

Kill or take certain birds, including the taking, damaging or destruction of their eggs, or the disturbance of such a bird or the young of such a bird for the purpose of conserving wild birds.
To kill or take certain birds TPG3

Republic of Ireland

The 'Wild Bird Declaration' has been published in Ireland, for 2024 bird control.

The Minister for Housing, Local Government & Heritage has signed the State-wide Declaration to allow the control of certain wild bird species that are causing damage to crops, livestock and fauna or in the interests of public health and safety. The Declaration is effective from 1 January 2024 until 31 December 2024. Details are available here:
https://www.npws.ie/sites/default/files/files/general-declaration-1-january-2024-31-december-2024.pdf?fbclid=IwAR3T7W1d3jVwCdJv0IIXBt4XbuHRHXYta2PpiYg5PfRp-9ISDJ14oyXxIoA

Nigel Cheeseright returns to CRRU as chairman

The Campaign for Responsible Rodenticide Use UK's new chairperson is Nigel Cheeseright. Following a two-month handover from Dr Alan Buckle, who is retiring after two decades in the role, he begins a three-year term on 1 May.

New CRRU chairman-designate: Nigel Cheeseright

From 2010 to 2021 with Rentokil Initial as head of technical services then director of product development, Mr Cheeseright was also the company's representative as a CRRU director. In addition to "exemplary leadership and personal qualities", the CRRU selection panel's decision was based on "nearly four decades of operational and general management success in technical contexts." Balancing the pest control imperatives of public health protection, fire prevention and building damage minimisation on the one hand, and shielding non-target wildlife from rodenticide exposure on the other, demands high priority and continuity of leadership, according to Nigel Cheeseright.

"CRRU's successes to date, of which there have been many during Alan Buckle's watch, are built on the combined efforts of our many and diverse stakeholders," he says. "Foremost among these, of course, are the working members of our three industry sectors: professional pest control, gamekeeping and farming."

European Hornet

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Vespa crabro

Family: Vespidae

This eusocial hornet is native to Europe and the Queen measures up 35mm in length.

Originally from Eurasia, although it was introduced into North America in the 19th century

Should not be confused with the Asian hornet, an invasive species. The European hornet is a larger size and has a more colourful appearance.

They make nests by mixing wood with saliva to make a 'papier mache' like substance with an opening at the base.

They prefer flight rather than attack, although they will sting in defense of the nest.

A protected species in Germany

Top photo: Vespa crabro. Martin Cooper (cc). Flickr.

Bottom photo: Vespa crabro. Ernie (cc). Wikipedia.

Busting Bed Bug Myths: Separating Fact from Fiction

Written by Arctech Innovation

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There is not yet clear scientific evidence to support the apparent bed bug "explosion" which swept across France in October 2023, however the spike in reported sightings at the time was hardly surprising.

The reality is that bed bugs already exist in many places. Bed bug infestations have become more common over many years in the UK and across the world, with the spread of these pests driven by factors such as climate change, global travel and insecticide resistance. This is very much a bug's world!

At Arctech Innovation, we are pioneering innovative products to allow us to live smarter in a bug's world – including our BugScents® lure with trap solution, which utilises natural pheromones to attract and detect bed bugs fast before an infestation takes hold, with further advancements in automatic detection under development.

For experienced pest controllers, the challenge of tackling bed bugs is not particularly new. Yet widespread media coverage and trending social media posts has triggered a wave of hysteria and misinformation on bed bugs to spread amongst the general public. You may notice your customers telling you some odd anecdotes or theories about bed bugs, so we have taken a closer look at some of the more common myths.

Bed bugs only infest unclean spaces:

Contrary to common belief, bed bugs don't discriminate – it doesn't matter who you are, where you live or how clean your house may be. Bed bugs can be found in five-star hotels or backpacker's hostels. Our CEO at Arctech Innovation, Professor James Logan, was once bitten in business class on a flight. This is a myth that can create an unfair societal stigma on a customer who has become the victim of bed bugs through no fault of their own.

Everyone reacts to a bed bug bite:

Detecting a bed bug infestation can sometimes be slow to achieve due to a lack of familiarity in customers about the signs of infestation, such as blood spots on the sheets and the presence of bites. In fact, most people don't react to bites, and because bed bugs are most active during the night, residents may not notice an infestation until the population has grown large. Early detection using monitoring products such as our BugScents® lure is key to successful control.

Bed bugs can't be seen by the naked eye:

The adult bed bug is generally the size of an apple seed (5-7 mm), is oval in shape and has a brown colour. If it has fed recently, it will appear redder. However, in their development stage (known as nymphs), bed bugs are typically smaller, and a more white-yellow colour. Despite many people's misconception, you can certainly see bed bugs, nymphs and their white eggs all with a naked eye – though they can be hard for customers to spot since they come out in the small hours.

Bed bugs live exclusively in the mattress:

Customers often imagine they will see bed bugs crawling around on the mattress but that's actually quite rare. Whilst they can be found hiding along the seams of a mattress, it's more likely they are found in the bedside table, under the carpet or in dark crevices of nearby furniture and walls. In fact, bed bugs generally only come out from hiding to blood-feed on a human or animal host.

Over-the-counter (OTC) products are a suitable replacement for professional help: Bed bugs are notoriously difficult to treat, particularly due to growing resistance to pyrethroid insecticides. Whilst there are OTC products which can help customers to confirm if bed bugs are present, home remedies for elimination, on the other hand, are no match for the work of professionals. As a community, we must continue to educate customers on the importance of calling a pest controller to properly treat bed bugs as early as possible before a larger infestation takes hold.

This article has been written by Arctech Innovation, a pest research and product innovation company. Arctech Innovation is developing new solutions for pest controllers to add to their arsenal to tackle the growing problems of bed bugs. This includes a unique and effective pheromone lure and trap (www.BugScents.com) for rapid detection of bed bugs. Recommended for identifying new & existing infestations as well as post-treatment and perimeter monitoring, making treatment easier and customers happier.

Phantom Biting Insects & Solutions

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Pest Control News features an article from John Lloyd (Q&FS Pest Management Consultant at Independent Pest Management & Insect Consultancy Ltd)

There can be many causes for 'pimple like' reactions on the skin and often biting insects are thought to be the cause. Sufferers frequently call out a pest control company, and when pest contractors visit they may might find that a pest control company has previously visited and carried out an insecticidal treatment in the past even though no evidence of biting insects was found. 'Precautionary' treatments do little to help the sufferer as they provide a false hope for resolution. Therefore important when attending a problem concerning suspected phantom insect bites adopting a broader approach when investigating potential root cause or may help to shed light on possible cause and future actions required to resolve a problem.

There can be many potential causes in the environment that result in skin reactions for sufferers and establishing root cause can provide surprising results. It is therefore important to remain sympathetic, open-minded and base the next step on results from inspection and monitoring. Depending on findings from the assessment, it can be possible to eliminate some potential causes in the environment and to highlight other possible factors causing 'bite like' reactions and distress. This new information will help to highlight new areas for investigation or possible interventions required to resolve the problem.

Delusional Parasitosis

Delusional parasitosis is a delusional disorder where sufferers experience a fixed, false belief that they have an in infection with a parasite, worms, mites, bacteria, fungus or other types of living organisms(*1). It is a psychiatric condition where people have an 'unshakable belief' that they are infested with ectoparasites or endoparasites.

Presentation of the condition

Other than their delusion, sufferers usually appear normal and often claim infestation is occurring on or under the skin, or in or around body openings. Typically sufferers believe parasites are widespread in their home or work place and have often suffered from the infestation for some time. Often they have already consulted health practitioners and may have already used a pest control contractor to carry out treatments in the past.

Delusionary parasitosis is more than a delusion it can have a profound effect on sufferers - they may suffer chronic anxiety, chronic lack of sleep, depression or even suffer from self harm.
There can be deterioration in the quality of life and socialising as sufferers can withdraw from society by stopping their visits to see family members or friends due the mistaken belief of carrying biting insects with them and causing infestations in other homes. Social isolation can also occur as sufferers also stop visitors coming to their home. This might include suspending visit or overnight stays by grand children or other family members. All of this further increases the anxiety and distress when living with the Delusionary Parasitosis.

The psychological impact and social distress caused for sufferers can be wide ranging and profound. Whether in the home or work place it is always important for pest controllers to be sympathetic and to empathise with sufferers. It is important to listen carefully and not to be dismissive. Sometimes verbal clues are provided that can help your investigation into establishing an environmental cause.

Environmental causes

'Pimple-like' reactions from biting insects are typically caused by antigen-antibody reactions in response to anticoagulant/ anaesthetic in insect saliva triggering an immune response within the body and resulting in inflamed marks on the skin where bite has occurred. Secondary bacterial infections can result due to scratching and breaking of the skin manifesting itself as localised inflammation or surface skin reaction.

General causes for Phantom Biting Insects

i) **Delusionary parasitosis** – An 'unshakable belief' that a sufferer is infested with or being bitten by living organisms.

ii) **Environmental causes**

Examples of causes in the environment

Investigations, Methodology & Sampling

Commercial Environments

Domestic Environments

CAUSE	OCCURENCE	CONTROL
Paper splinters from handling paper	Small paper splinters may cause itchy rashes to occur & reactions are exacerbated by presence of static electricity.	Adjust working practices. Wear gloves if necessary. Deep & regular cleaning. An anti static spray treatment could be considered.
Heating systems	Warm air may circulate small fibres in the air. These can land on skin & cause irritation - especially in confined working areas.	Inspect heaters or heating system. if necessary, clean or repair. Consider HEPA air filters. Clean WJS & floor areas.
Ventilation/Air handling systems	Fibres from air filters, ducting or particulate airborne debris circulated by air can irritate skin.	Inspect filters, ducts, air intake/output points. Check records for replacemenr of filters & check when last cleaned.

Investigations into cause & source

Investigations into the cause and source of apparent insect biting activity should be conducted by pest controllers with care - to (i) determine biting insects are actually present; (ii) determine if the cause is due to environmental stimuli or (iii) determine if the person is suffering from delusional parasitosis.
A careful survey, monitoring and inspection programme may result in a positive outcome - or at least provide a key step in helping to eliminate some of the potential causes.

There are many potential sources or causes in the environment for insect bite-like skin reactions and these can include a wide variety of physical stimuli in the home or work place such as.

- Electro Static Discharge (ESD)
- Paper splinters
- Carpet fibres including woollen or synthetic fibres
- Heating systems (rising air circulating particles in a localised area)
- Ventilation/Air Handling Systems (circulating fibres or even small air borne particulate debris causing it to land on the skin)
- Responses to chemicals such as paint, lacquers, disinfectants or cleaning products

Phantom Insect Bites – Possible Causes & Solutions

Electro Static Charge

Walking on synthetic carpets can statically charge particles in the fabric causing static charges to build up and dissipate. Also accumulated debris along wall floor junctions or under desks may become exposed to a build up of static charge in the environment. Usually harmless but constant exposure can result in charged particles attaching to bare legs or skin. Sometimes a scratching reaction breaks the skin and pimple-like marks or redness of skin can be seen as a result of an immune response.

Solution

The use of anti-static carpets or the application of an anti static water based spray is recommended to dissipate the static charge in work place. This is safer than a precautionary insecticidal treatment, and avoids deploying neurotoxins in the work place. It is a beneficial solution to commercial premises where no evidence of biting insect activity has been found.

Commercial & Domestic Considerations

Monitoring and assessment by pest controllers can not only demonstrate the presence or absence of biting insects, it can provide clues for possible cause or source. Phantom biting insect issues occur in both commercial and domestic environments and although the methodology of assessment is similar, it is important to be aware of implications surrounding the issue. Consequently great sensitivity is required whether dealing with a commercial or domestic incident.

Investigation-Methodology

Speak to the sufferer directly to determine the nature of the problem. Always be sensitive, sympathetic and understanding. Always remember that the sufferer may be suffering genuine anxiety or extreme distress either at home or in the workplace.

Deploy a liberal number of adhesive glue cards to detect the presence of insects/invertebrates or to trap fine airborne fibres or particulate debris. These will help to provide visual clues for a potential cause.
Always be sensitive, sympathetic and understanding and remember people may be suffering genuine anxiety or extreme distress.
Don't try to guess the cause - just report what you see in your findings.

Areas frequently affected by Phantom Biting Insects

- **Domestic premises**
- **Areas of electrical equipment or cabling (ESD)**
- **IT Centres & Computer desk areas (ESD)**
- **Call centres (ESD)**
- **Large office areas & confined offices areas (ESD or particulate airborne debris from air handling or heating systems)**
- **Regular uses of electrical equipment (ESD)**
- **Public buildings & institutions such as hospital waiting rooms, prison visiting. (ESD or particulate airborne debris from air handling or heating systems)**

Phantom Biting Insects – Inspection

Inspect for signs of biting insect activity and check for the presence of dust, fibres, particulate debris and debris on floors, horizontal surfaces and in the following areas:

- ✓ Inspect floor areas, wall floor junctions & corner areas.
- ✓ Check overhead & ground level horizontal surfaces.
- ✓ Check the presence of fur, hair or conditions for biting insect pest harbourage.
- ✓ Check the quality of cleaning along edges and wall floor junctions & note methods & frequency of cleaning.
- ✓ Check overhead air vents for signs of debris or servicing.
- ✓ Check cleanliness of heaters & radiators.
- ✓ During inspection take 'swabs' from floors and surfaces with a brush or glue card.
- ✓ Set up a sampling plan & record where monitors are deployed.

Optional – Deploy an electric flea trap (s) to show if fleas or fibres are present on the glue board.

Return after 5-7 days to collect monitors and to investigate further. Sometimes results from swabbing samples cause closer inspection of an area – or require further questions for the sufferer. Always listen carefully to replies as this can provide important clues for possible cause.

Conclusion

Investigations by the pest controller can indicate if biting insect pests are present or absent or they may indicate a possible source – either synthetic fibres or airborne particulate debris. The absence of any of these could suggest sensitivity to chemicals in the environment (such as DIY pest control measures) or the presence of Delusional Parasitosis.

The monitoring programme and results obtained by the pest control contractor may be the first step in resolution by recommending deep cleaning of floors, heaters or air handling systems.

In domestic environments often potential causes for resolution include a need for deeper cleaning of floors or areas where pets rest or sleep. It is therefore important to document and to emphasise the need for improved standards of cleaning or improvements in pet hygiene.

Delusionary parasitosis

For extreme sufferers negative results usually offer little comfort because of an 'unshakable belief' in the presence of biting insects. However, it is possible as a 'next step' to refer sufferers to an appropriate specialist such as environmental professionals, specialist cleaners or medical professionals.

Data captured by the pest control contractor provides important documentation for Employers, Landlords and local authorities. Where appropriate, reports should make it clear that there is no evidence of biting insect activity has been found.

Unnecessary precautionary spray treatments should be avoided because they are not required, they provide a risk to public health and they give false hope of a resolution of the control of biting insects in the home.

Examples of Results

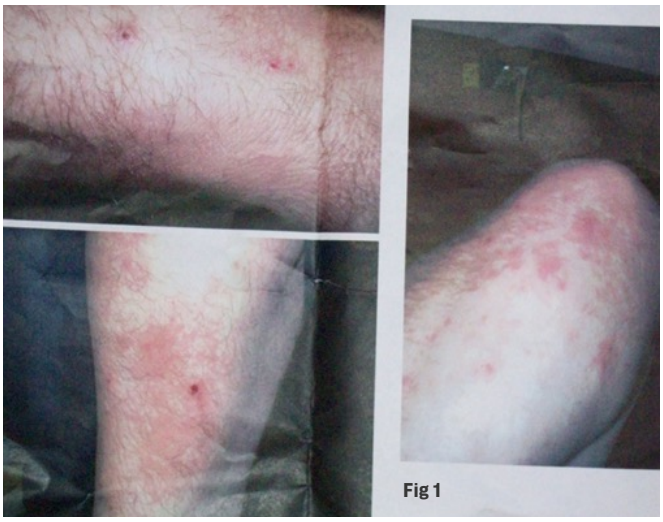
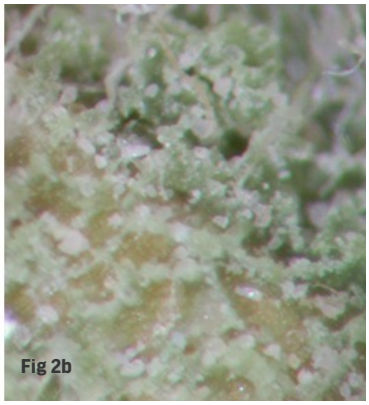
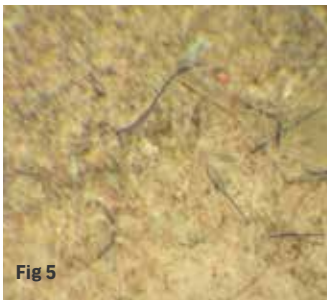


Fig 1 show skin reactions in a factory environment where airborne particulate debris was present.



Small particulate airborne debris on a glue trap. **(<1mm) in factory environment deposited**

Fig 3 & Fig 4 Showing microscopic fibres in the environment detected on glue boards



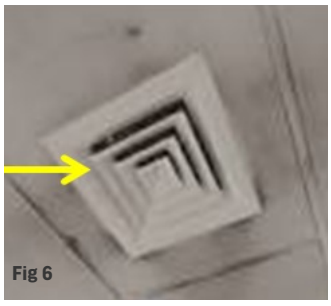


Fig 5 & 6 Showing debris being blown from an overhead air vent onto employees in the workplace where a high incidence of Phantom insect bites were being reported.

*1 (Lynch PJ. Delusions of parasitosis. Semin Dermatol. 1993 Mar;12(1):39-45. [HYPERLINK "https://pubmed.ncbi.nlm.nih.gov/8476732"PubMed])

The Zombie Fly Phenomenon: A Frightening Fusion of Fungus and Flight

In a scenario that seems lifted straight from a science fiction novel, researchers at Harvard University have uncovered startling insights into a parasitic fungus that transforms unsuspecting fruit flies into zombies. This microscopic puppeteer, known as *Entomophthora muscae*, hijacks the neural pathways of fruit flies *(Drosophila melanogaster)*, compelling them to scale to elevated positions just before their untimely demise.

Unraveling the Mystery:
The concept of 'zombie' flies has long intrigued scientists, yet the underlying mechanisms remained shrouded in mystery. The revelation that these flies don't simply climb, but rather exhibit a sudden burst of energy prior to death, is a significant breakthrough. Carolyn Elya, a cell biologist and self-professed zombiologist, has been pivotal in shedding light on these bizarre behaviors.

The Role of Machine Learning:
In a nod to the interdisciplinary nature of modern science, the team employed machine learning techniques to identify summiting flies. This innovative approach facilitated the observation and collection of critical tissue samples, providing a window into the genetic and neuronal processes at play.

Neurological Manipulation:
The findings are both fascinating and unsettling. The fungus selectively targets specific areas of the fly's brain, manipulating circadian rhythms and hormone production. Remarkably, when certain neurons were deactivated, the flies exhibited impaired summiting abilities, underscoring the fungus's intricate control over its host.

Blood-Brain Barrier Breach:
A particularly intriguing discovery is the increased permeability of the blood-brain barrier in infected flies. This alteration suggests a sophisticated strategy by the fungus to influence the fly's behavior through substances in the bloodstream.

The Role of Fly Blood:
In a twist reminiscent of a horror film, the researchers demonstrated that transferring blood from infected to healthy flies induced similar hyperactive behavior. This finding implies that certain bloodborne substances play a role in the summiting phenomenon.

The Fungal Life Cycle:
E. muscae begins its invasion with a spore landing on a fly. Utilizing enzymes to penetrate the exoskeleton, it devours the fly from within, strategically preserving vital organs until the final stages. The fungus's exit strategy involves immobilizing the fly and protruding through the skin to release spores, relying on the fly's elevated position for maximum dispersal.

The Unanswered Questions:
This research, while illuminating, leaves many questions unanswered. The precise timing of summiting behavior, the specific chemicals involved, and whether physical contact with the brain is necessary for full manipulation remain areas of active inquiry.

Conclusion:
The intersection of entomology, neurobiology, and machine learning has unveiled a small part of nature's intricate tapestry. As Carolyn Elya rightly points out, the enigmatic workings of E. muscae open up a world of scientific curiosity and exploration. This study, published in eLife, not only contributes to our understanding of parasitic relationships but also challenges our perceptions of free will in the animal kingdom.

Original source: https://www.sciencealert.com/mind-controlling-fungus-forces-zombie-flies-into-a-death-climb

12 Years of Monitoring Barn Owl Breeding by CRRU UK

The Campaign for Responsible Rodenticide Use (CRRU) UK has monitored barn owl breeding in collaboration with the Wildlife Conservation Partnership (WCP) every year since 2011. Over the study's 12 years, the percentage of successful nests ranged between 23.2% in 2013 and 64.5% in 2014, with the annual average 46.3%. An average 2.9 chicks flew from every successful nest.

WCP scientists monitored at least 130 nests annually in five regions of England to track nest occupancy, the numbers of eggs laid and barn owl chicks leaving these nests. The barn owl is the sentinel species nominated by government scientists to measure whether or not the UK Rodenticide Stewardship Regime is meeting environmental targets [Ref 1].

Many of the adult birds studied will have been carrying rodenticide residues that CRRU monitors in another annual survey undertaken in conjunction with the UK Centre for Ecology and Hydrology [Ref 2]. These studies show about 85% of UK barn owls carry, usually, very low residues of rodenticides. Very few owls are killed by these residues and no relationship has been found between residues and barn owl breeding.

CRRU chairman Dr Alan Buckle says, "The intention of the breeding study was to work with barn owl experts in monitoring individual barn owl nest sites over several three-to-four year 'boom and bust' cycles of their preferred prey, the field vole. We wanted to see how breeding success changed from year to year."

The main factors in determining success or failure of barn owl breeding are likely to be prey availability and spring weather, particularly when this involved events such as 'the Beast from the East' in 2018 for example.

Having gathered 12 years of results, the study has now come to an end. Over this period, the British Trust for Ornithology (BTO) tells us that almost 92,000 barn owl chicks were raised from nests across the UK. The last full census of the British barn owl population, Project Barn Owl, was funded by industry and conducted during 1994 to 1996 by BTO and the Hawk and Owl Trust. This was probably an historical low point and only 4,000 breeding pairs were found [Ref 3].

More recent BTO studies show that, in spite of ongoing contamination with rodenticides, barn owls in the UK have increased both in numbers and geographical range since Project Barn Owl [Ref 4]. Colin Shawyer of the Wildlife Conservation Partnership says, "I am delighted by the success of this research and the work carried out by barn owl conservation workers across the country. Their efforts have resulted in an increase in the breeding population from 4,000 pairs in 1996 to an estimated 14,000 breeding pairs today, over 75% of which breed in nest-boxes provided by conservation initiatives."

Reports of the CRRU-WTP studies have been produced annually by the University of Reading and can be found on the CRRU website [Ref 2].

Author accreditations: Dr Alan Buckle, Visiting Research Fellow, University of Reading; Dr Colin Prescott, Honorary Research Fellow, University of Reading; Colin Shawyer, Principal Scientist, Wildlife Conservation Partnership.

Ref. 1: https://www.hse.gov.uk/biocides/assets/docs/rodenticides-stewardship-regime-gog-rev-jan2020.pdf

Ref. 2: https://www.thinkwildlife.org/downloads/

Ref. 3: https://www.bto.org/sites/default/files/u31/downloads/details/projectbarnowl.pdf

Ref. 4: https://www.bto.org/our-science/projects/breeding-bird-survey/latest-results/population-trend-graphs

THINK WILDLIFE
Campaign for Responsible Rodenticide Use

Kit maintenance - Gloria Multijet Washer

It is that time of year to talk about 'Spring cleaning' and with that in mind, PCN covers kit maintenance of the Gloria Multijet Washer. Also thinking of bird control (see our article on Bird Licences for 2024), the pressure washer approach is ideal for bird guano removal from balconies/ledges.

Another option for the use of this pressure washer is general cleaning of bins, bin areas and vans. From a 'Spring clean' / 'fresh start' point-of-view, this is a great thing to do. Cleaning / washing is also an essential component of integrated pest management for both rodent control and insect control.

The foam set can be used to create a foam to aid in general cleaning /disinfection – think back to the last issue where we covered pathogenic bacteria carried by rodents, where use of disinfectants and cleaning are a way to protect public health.

With the need for the Gloria Multijet Washer established (note the convenient availability of a rechargeable battery too – very mobile!), we should now consider the key aspects of troubleshooting/maintenance.

Troubleshooting the MULTJET and the AI 1810 CV battery charger

Faults usually occur if the device has not been handled, cared for or maintained properly. The following table contains the most common faults and remedies to eliminate these faults. If you have any other problems, please contact your nearest service centre authorised by the manufacturer, or your nearest authorised specialist dealer.

Fault	Cause	Remedy
Device does not start	Battery not inserted properly	Insert the battery into the holder until it clicks into place
	Battery capacity too low	Charge the battery
	Faulty battery	Battery defective or at the end of its life. Replace the battery
	Battery overheating, battery status indicator lights up red	Allow the battery to cool down
No pressure is built up, or the pressure varies	Water supply interrupted or filter blocked	Ensure the correct water supply
	Nozzle or extension blocked	Clean the filter and the nozzle. Remove any dirt in the extension
	Inlet hose is leaking at the connection, air is being drawn in	Replace the connector if necessary
The device is leaking	Slight leaks with droplets at the connections arise due to the design and are not a defect	Check the connections and any screw fittings and tighten them up as required
Status display batt; 4 displays flash	Overload cutout/temperature protection	Allow the device and the battery to cool down for around 5 minutes and do not use them in that time
	Low voltage cutoff	Charge the battery
Water in the device	Used during rain	Hold the device vertially so that the water can run out of the discharge openings.
	Fell into water	Allow the device to dry out for 24h
	Housing damaged	Contact the customer service section
Battery charging display continuosly lit, charging is not possible	Battery not inserted properly	Insert battery correctly into the charger
	Battery contacts dirty	Clean the battery contacts, e.g by plugging in and unplugging the battery several times, if necessary replace the battery
Battery charging display does not light up	Mains plug for the charger has not been plugged in (properly)	Insert the mains plug (fully) into the mains outlet
	Mains outlet, power cable or charger defectve	Check the mains voltage. If necessary, have the charger checked over by an authorized repair shop for GLORIA electrical power tools

A new era in British wildlife conservation: The smart trap triumph in American mink eradication

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In a groundbreaking trial that mirrors the best of human ingenuity and conservation efforts, the East Anglia region has witnessed a significant victory against the invasive American mink. This success story heralds a new chapter in our quest to protect native species and ecosystems.

The Invasive American Mink: A Brief History

The American mink, a species not native to the British Isles, found its way here through the fur trade. Escaping from fur farms, these mustelids wreaked havoc on local fauna, particularly the water vole, alongside various native birds, fish, and amphibians. Their presence marked a dark period in our natural history, with unchecked predatory behaviors leading to drastic declines in indigenous species populations.

The East Anglia Triumph

In a concerted effort to reverse this ecological crisis, a coalition of conservation charities and water management organizations, including the pioneering Waterlife Recovery Trust (WRT), initiated a trial in 2019. Their strategy? Deploying 441 'smart' traps across central and eastern Norfolk and Suffolk, an area covering 5,852 square kilometers.

These traps, ingeniously designed, utilized the mink's potent anal scent gland to lure them. This method, coupled with their 'smart' technology, which sends alerts via text and email upon a trap's activation, revolutionized the trapping process. It enhanced animal welfare and reduced the manual labor of daily checks.

Results and Implications

The results are nothing short of remarkable. By 2023, there was no evidence of mink reproduction within the targeted area. Professor Tony Martin, chair of the WRT and an authority in eradicating non-native predators, encapsulated the sentiment: "The complete removal of American mink from Britain has been an impossible dream, but the success of this trial offers hope that a century of catastrophic damage to precious native wildlife can be brought to an end."

Beyond the Trial: A Race Against Time

The implications of this trial extend far beyond East Anglia. With water vole populations plummeting by 96% since 1950 and coastal seabird colonies within the mink's reach also suffering, the need for a nationwide rollout of this method is urgent.

The Path Forward

The trial's success is a clarion call for broader action. Dr. Julie Hanna, species conservation advisor for Natural England, highlights the potential for these strategies to contribute significantly to the government's targets to halt species decline under the Environment Act 2021.

Original source: https://www.theguardian.com/environment/2024/jan/15/smart-trap-trial-raises-hopes-american-mink-can-be-driven-from-uk

Sucralose: A Sweet Solution to the Cockroach Conundrum

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In the bustling urban jungles across our planet, a tiny adversary often goes unnoticed yet plays a significant role in our daily lives. The German cockroach, scientifically known as *Blattella germanica*, is more than just an unwelcome guest in our homes and businesses. These creatures are vectors for allergens and a variety of pathogens, including *Salmonella*, *E. coli*, and Rotavirus.

Traditionally, our battle against these pests has been waged with insecticides in various forms, but this approach has its downsides, not least the development of resistance by the cockroaches and the potential harm to other, non-target species.

Enter the scientists from the University of California, Riverside (UCR), who, in a fascinating twist, are exploring the potential of an artificial sweetener as a novel weapon in this ongoing battle. Their research, published in November 2023 in the Journal of Economic Entomology, centers around sucralose (widely known as Splenda). This common sweetener, typically found in our food and beverages, has been identified as having a surprisingly lethal effect on German cockroaches.

The team, comprising Shao-Hung Lee, Dong-Hwan Choe, Michael Rust, and Chow-Yang Lee, is no stranger to the challenges posed by these resilient insects. They previously uncovered widespread resistance to conventional insecticides among California's German cockroach population. This discovery has prompted a search for alternative methods of control, leading to the intriguing possibility of employing artificial sweeteners, which have low toxicity to mammals, as a new form of insecticide.

The research delves into sucralose's impact on the cockroaches, examining how varying concentrations affect mortality rates, the dehydration process in the insects post-exposure, and even changes in the gut bacterial diversity. The results are compelling. Higher concentrations of sucralose correlate with increased mortality, and a prior exposure to the sweetener exacerbates the lethal effects.

What is particularly striking about this research is the mechanism of death. Unlike traditional insecticides that target the nervous system, sucralose seems to induce death through dehydration. This unique mode of action may provide a new avenue in combating insecticide-resistant strains of cockroaches.

However, as with all scientific endeavors, this study is but a step in a longer journey. The effectiveness of sucralose against a broader spectrum of insect pests remains to be seen, as does its efficacy in real-world scenarios beyond the controlled conditions of a laboratory.

The promise of sucralose, as highlighted by the UCR team, lies not only in its potential as a tool against resistant strains of German cockroaches but also in its environmental benefits. If successfully formulated into an effective bait, it could significantly reduce the amount of traditional insecticides released into our environments.

As the research continues under the guidance of Chow-Yang Lee's group, we stand on the cusp of a potentially groundbreaking shift in our approach to pest control. The sweet taste of sucralose, so familiar to us, might just be the unexpected ally we need in our ongoing struggle against the resilient and ever-adaptive German cockroach.

Original source: https://entomologytoday.org/2024/01/10/sucralose-artificial-sweetener-cockroach-pest-management/

Health and safety - acronyms for the pest industry and beyond, what do they all stand for? - Part 2

We continue to delve into the acronyms relevant to the pest management industry and of course wider health and safety. Hopefully this should simplify all those confusing initialisms! This is part 2 of several as they just would not all fit into one article. Let's look at legislation and associated health and safety acronyms.

Legislation and associated Health and Safety

CRRU: The Campaign for Responsible Rodenticide Use. Originally founded in July 2015 launching a Stewardship scheme whereby all users of professional use rodenticides are training to certain standards. With the most recent update at time of going to print of July 2021, CRRU encompasses a code of best practice, incorporating 7 points for rodent control and the safe use of rodenticides.
Accessed via **www.Thinkwildlife.org.**

PBMS: Predatory bird monitoring survey. A benchmarking program looking at rodenticide residues in predatory birds, reporting to the government, heavily referred to by CRRU and part of the reasoning for the original inception of rodenticide stewardship and CRRU.

SGAR(s): Second generation anticoagulant rodenticide. Examples: Bromadiolone, difenacoum, flocoumafen.

FGAR(s): First generation anticoagulant rodenticide. Example: Coumatetralyl.

RAMPS: Register of Accredited Metallic Phosphide Standards, focusing on the RAMPS code of practice. Ramps-uk.org.

EA: Environment Agency. Aims to protect and enhance the environment in England. Promoting better places for people and wildlife.

SEPA: Scottish Environment Protection Agency. The main agency for protecting, regulating, and improving the environment in Scotland. Natural Resources Wales: No real acronym for this, Natural Resources Wales is the equivalent of the EA and SEPA.

HSWA or HASWA: The Health and Safety at Work etc. Act 1974.

COSHH: Control of Substances Hazardous to Health Regulations. These regulations sit under the HSWA 1974.

FEPA: The Food and Environmental Protection Act 1985.

COPR: The Control of Pesticides Regulations 1986 (these were updated by the COPR (Amendment) Regulations 1997 (SI 1997/188 along with several other pieces of legislation, so you may see COPR 1986 (as amended) on product labels. Similarly in Northern Ireland: Control of Pesticides Regulations (Northern Ireland) 1987 (SI 1987/414, as amended).

BPR: Biocidal Products Regulations. BPR regulates biocidal products to protect humans, animals, and materials against harmful organisms.

ECHA: European Chemicals Agency. Responsible for implementation of chemical legislation to protect health and the environment.

REACH: Registration, Evaluation, Authorisation and restriction of chemicals. Now this is UK REACH.

PPPR: The Plant Protection Products Regulations 2011.
DEFRA: Department for Environment, Food & Rural Affairs. 'The government department responsible for the policy and regulations on the environment, food and rural issues.

FSA: Food Standards Agency. Another government agency, responsible for food safety and hygiene.

EHP: Environmental Health Practitioner.

CDC: Centres for Disease Control and Prevention – the nation's health protection agency United States).

HSE: Health and Safety Executive. A regulator for nations workplace health and safety.

WIIS: Wildlife Incident Investigation scheme. They investigate death or illness of wildlife and pets amongst other objectives, including pesticides poisoning.

RA: Risk Assessment. This falls under the Management of Health and Safety at Work Regulations 1999 (the subordinate legislation under the Health and Safety at work Act 1974).

MS: Method statement (also known as safe work system, safe work practice, safe work protocol).

RAMS: Risk Assessment and Method Statement. Remember this is usually two documents.

MSDS or SDS: Material Safety Data sheet or Safety data sheet.

LD50: The amount of chemical that is needed to cause death in 50% of the animals exposed to it, usually expressed as g/Kg. Often seen on rodenticide **MSDS.**
LC50: Lethal concentration required for 50% of the tested group of a population – very similar to LD50, but usually used for gases or liquids. Often seen on insecticide MSDS.

Proofing for rodents

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Proofing techniques do not seem to have changed in decades. However, buildings and the additional services required have, often far advancing anything that could have been imagined decades ago. The previously simple warehouse, for example, is now installed with servers, data cables, automation, and robotics. These all require pathways for pythons carrying the cables required. In most cases, these breach the building and the originally designed solid, cladded walls and concrete floors.

If it is not broken, do not fix it?

If techniques have not really changed and rodents follow the similar basic behaviours, do we need to alter things? If old buildings had not been retrofitted with additional holes to allow enhancements in communications, data, power then no, we would be following the same protocols, but they have not. If new buildings were not designed in such a way, to allow numerous proofing breaches, we would not need anything new. There is still nothing wrong with wire wool, sealant and cement.

A recent realisation, looking at original leaflets and reference materials dating from the 1970's specifically focusing on rodent proofing, brought to light that proofing techniques have not really changed. Considering the surge in technologies in buildings, we do need to think further and adapt to proof this new challenge. As pest management professionals we need to be able to show a competent, compliant, and efficient response that will keep rodents out.

So, what is new?

A few years ago, there was a slew of new sealant type products, designed with impregnated wire wool, anti-gnaw PS pearls, specifically designed to stop rodents and/or deter them. The humble bristle or brush strip came along in the early 1960's and is still a mainstay of the proofing arsenal. New varieties of brush strip, containing polymer coated wire wool, have quickly taken a well-deserved place in the proofing toolkit. Door-seal strips were made for automatic and sliding doors. This combination, of several proofing techniques, culminates in a great range of products to deter rodents.

There are some rather ingenious rodent brush products - a flexible brush which can be cut to size and moulded into holes or gaps. For example, these can be used around cables and removed quickly if access is required.

Some of the latest products to appear on the scene are very simple to use - flexible rodent mesh that can be compressed (under the Xcluder brand), by cleverly flexing to fill the gap. Products from Raxit have been a breath of fresh air for proofing. The Raxit Doorseal is an example - a proofing seal that is reinforced with steel wires to prevent access by rodents, stopping them in their tracks. Rat tape - an incredibly tough rodent proofing tape that contains a stainless-steel mesh core sandwiched by butyl tape. Whilst maintaining flexibility, this tape is near impenetrable to rodents. It is also incredibly adhesive, and can be used to cover cracks, holes, and can even be overlapped for larger areas. It can also be painted.

All these products are easy to use and easy to apply. They are wonderful alternatives that quickly and easily provide proofing solutions and remain highly resilient against rodent entry.

It is all about using the right tool for the job...

Expanding foam has its place, however that place is not long-term and is not ideal for preventing rodents from entering. How many times have you seen foam gnawed through? A tell-tale sign is expanding foam chips strewn around the hole, from rodent gnawing activity. By being armed with the latest innovations in proofing products we can project absolute professionalism by knowing exactly what to use to proof that hole, seal that door, and prevent entry from rodents. Fully supporting Integrated Pest Management with the proofing and restriction of rodent movement, we can prevent a rodent issue before it even starts - quickly and simply, ensuring 'proactive' is included in the pest controller's mentality.

To summarise:

- There are some great innovations in proofing – make sure you are familiar with them; it is not just tape/brush/strip/sealant – its steel mesh impregnated tape/brush/strip/sealant.
- There is nothing more satisfying than saying 'I've got just the thing for that.'
- Think ahead, as these products are cost effective and add value to your jobs by factoring in the proofing via cost and labour. The added benefits are being able to use your knowledge and project professionalism.
- Easily help your customers to keep their premises free from rodents.

In conclusion...

Keep an eye out for retrofitted cables, pipes etc., as they will have gaps around them. Not everyone has the professional knowledge of rodent behaviour. For example, the minute holes they can fit through (proof to 6mm!) - we do and can competently advise and proof them out. There are more and more services in buildings now, even new builds, and final snagging is not always up to par. Use your knowledge to be the proactive professional and really push standards.

Experience superior palatability with Advion® gels

When cockroaches & ants love Advion® gels this much! - they'll help you get the job done!

Controlling cockroaches and ants can be challenging if your products aren't palatable enough for their specific feeding preferences. Fortunately, Advion® Cockroach Gel and Advion Ant Gel are formulated with enhanced bait matrices that are highly palatable to these pests.

The most palatable cockroach gel in Europe!

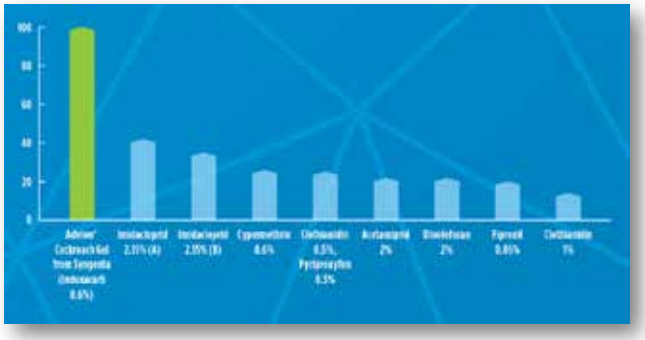
Advion Cockroach Gel has an attractive formulation that results in high consumption among cockroaches. It's been proven to be palatable very soon after application, as well as remain stable and effective for at least three months after application. In a recent study, Advion Cockroach Gel was proven to be up to five times more palatable than eight different products tested.

In the above lab trial, every cockroach gel was individually compared to Advion Cockroach Gel. Lab food and water were provided as well. The number of German cockroaches visiting the two discrete gel spots was counted for one hour. Advion Cockroach Gel always attracted more insects than any other gel tested. The two different imidacloprid gels, which were the best in this set of products, both attracted 50% less cockroaches than Advion Cockroach Gel. Additionally, German cockroaches visited Advion Cockroach Gel five times more frequently than they visited the fipronil gel when both were offered at the same time in the test arena.

Palatability adapted to ants' feeding habits

Ant feeding preferences are known to change readily. Some ants may prefer honeydew or sweet foods, while at other times, they may prefer other food sources like proteins or oils. The Advion Ant Gel formulation accounts for this variability, resulting in high acceptance by key ant species.

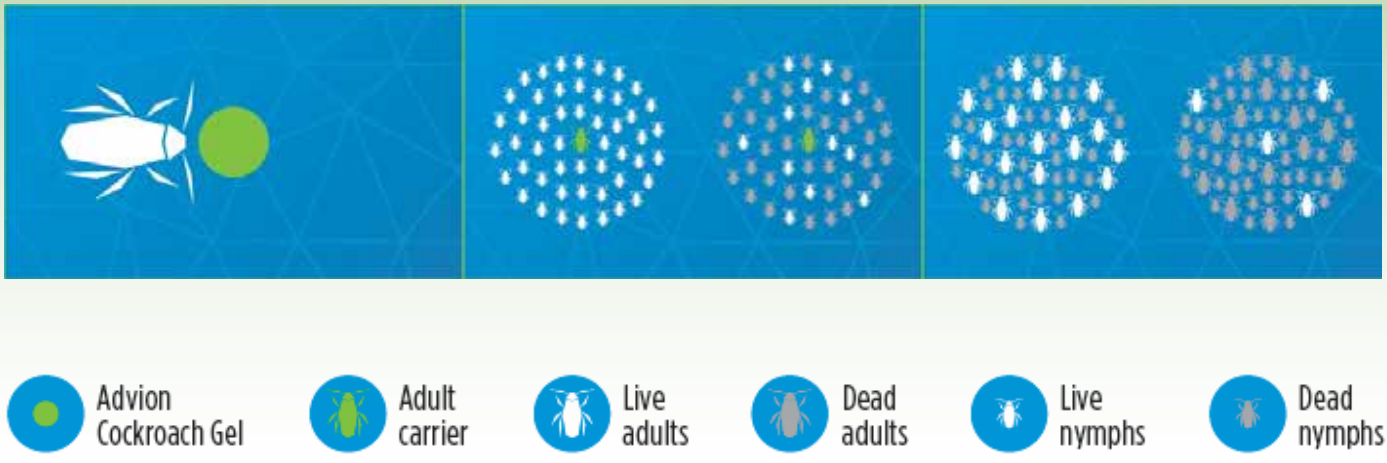
In fact, studies have shown that applying Avion Ant Gel in a bait station can help maintain its moisture and attractiveness for at least one month after application.



In a recent study, Advion Cockroach Gel was proven to be up to five times more palatable than eight different products tested.

Watch the following video to see the impact of Advion gel palatability against cockroaches and ants:
https://www.syngentappm.com/node/2951

How the transfer effects in Advion® gels provide thorough pest control



When dealing with cockroaches and ants, you need products that can be spread throughout the entire population to maximize control. Not to worry: Advion® gels can put these pests to work for you. The gels exhibit a slight delay in mortality once ingested by the target pests, allowing them to return to their harborages and colonies to contaminate the other insects for more thorough control.

Proven cockroach control with the triple transfer effect

Advion® Cockroach Gel can significantly reduce cockroach infestations via the triple transfer effect. The following diagram outlines the process in three steps:

- Primary kill: One adult male cockroach feeds on Advion Cockroach Gel and will be killed after a slight delay in mortality.
- Secondary kill: The delay in mortality allows the cockroach to consume the gel, return to the nest and then spread the toxic product to the other cockroaches. Studies have shown that after placing a fed adult male among 50 first-instar nymphs, 76% of those nymphs were dead after 72 hours.
- Tertiary kill: These dead nymphs were then placed among 20 other adult males, 81% of which were dead 72 hours later.

The three processes that allow **Advion® Cockroach Gel** to spread among cockroach populations are called horizontal transfer, which is possible because of the insects' specific behaviors.

- **Coprophagy**: Ingestion of toxic feces by other cockroaches
- **Emetophagy**: Ingestion of toxic regurgitates and secretions of the dying cockroaches
- **Necrophagy**: Cannibalization of dead cockroaches, which are saturated with an Advion gel

Young nymphs and gravid female cockroaches tend to stay in the harborage, while late nymphs and adult males are actively foraging and thus bring the toxic bait into the cockroach hiding areas. With these three ways to transfer the insecticide from the foraging insects to the other individuals, it is possible to eradicate cockroach populations hidden in areas of houses, restaurants and more, which are often difficult or sometimes impossible to find and treat directly.

Effective ant colony eradication with horizontal transfer

Advion® Ant Gel provides thorough elimination of ant colonies via horizontal transfer (also known as trophallaxis). After a foraging ant ingests the bait, the slight delay in mortality means this worker ant can repeatedly return to the colony to actively feed and transmit the gel to other colony members, including the other nest workers, larvae and the queen(s). This eventually leads to complete mortality of the entire ant colony and the queen(s).

With Advion® gels, you can employ cockroaches and ants to help you get the job done. For more information, watch the following video to see the triple transfer effect and horizontal transfer in action:
https://www.syngentappm.com/node/2951

Use biocides safely. Always read the label and product information before use.

New Products

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Chameleon® Stellaris

The unique Chameleon® Stellaris fly control system incorporates the latest UV LED tube technology Quantum® X, to deliver a whole new level of fly control. It is entirely made in stainless steel and IP66 certified, therefore offering advanced fly control for demanding environments and is suitable for areas that are steam-cleaned, hosed down and are damp or corrosive e.g. dairies, abattoirs and industrial kitchens.

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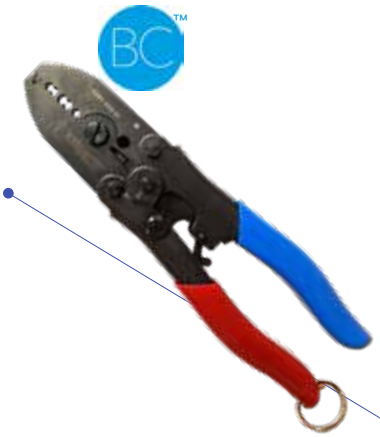

BC Crimping Tool

For crimping copper or aluminium ferrules onto pigeon and gull wire. A perfect crimp, every single time. Precision jaws shaped to crimp 4 sizes of ferrule. Features a high-leverage, integrated wire cutter. Ratchet controlled for quality to ensure the crimp is firmly completed before the handles release. Compound-lever action for one handed operation. Engineered for easy use and all-day comfort.

- For crimping nickel-plated copper crimps
- For forming the end loops in the wire attached to the post & spring.
- For crimping 1.5mm copper ferrules to 1.2mm wire rope for securing bait boxes.
- For crimping both 2.5mm Copper and Aluminium Ferrules to 2mm wire rope.
- For crimping 1mm Copper Ferrules.
- For cutting wire rope up to 2mm thick.

The BC Crimping Tool takes less energy so less fatigue to installers and pest controllers.

Visit www.killgerm.com

Fish Lure & Choconut Lure

Fish & Choconut Rat and Mouse Lure is a blend of food grade material and oil designed specifically for trap shy rats and mice. The long lasting formula is non toxic and has no known allergens. For use with any devices and glue boards, live traps and snap traps

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AuroTrap

AuroTrap is an effective rodent control system humanely trapping and killing rats, without the use of rodenticides. Transforming traditional and reactive rodent control into effective, proactive, and data gathering rodent control

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AF® Wasp & Fly Bags

The Fly Bag Trap is an effective way to lure blue bottle, green bottle and house flies away from sensitive outdoor areas with the specially formulated food grade attractant contained within a water soluble sachet. The flies are caught and trapped inside the bag which can be disposed of once full of flies. Ideal for outdoor use in farms, stables, gardens and bin areas.

Visit www.killgerm.com

NPTA national pest technicians association

NPTA Training Opportunities

Every year the National Pest Technicians Association (NPTA) goes 'On The Road' delivering training days at various locations around the UK and Ireland. These are full days of stimulating presentations, delivered by experienced experts, on a variety of different topics. There are a selection of trade stands at the day as well, so the complete experience provides:

Training on a varied selection of topics | Product support & product updates from representatives on the manufacturer and distributor stands | Opportunities to network with other pest management professionals | A hot lunch

The days are free for NPTA members; there is a small fee for non-members to cover the cost of the hot lunch and refreshments.

Dates and venues for 2024

9th April – Belfast (sponsored by Killgerm)

11th April – Portlaoise, Ireland (sponsored by Killgerm)

30th April – Perth, Scotland (sponsored by Killgerm)

15th May – Buckfast, Devon

4th September – Cwmbran, South Wales

11th September – Durham

16th October – Reigate

The actual presentations at each event vary, but as an indication, these are the topics planned for the first one at Nottingham:

Bedbugs by Richard Faulkner or ENVU | Rodent Baiting by Laurence Barnard of BASF | Bird Proofing by Grahame Turner of the NPTA | Business Development by Lulu Gunter of Trapeeezium | Rats in Drains by Davy Brown of Rat Detection | RPE by Ian Crellin of the British Safety Industry Federation | Textile Moths by Asa Goldschmied of Proton Environmental | CPD by Andy Brooks of BASIS.

The NPTA training department also provides other training opportunities, for example:

Risk Assessments, COSHH Assessments and Safe Systems of Work (1 day classroom training course at Nottingham on 21st February and Monmouthshire on 22nd February; with further dates and locations to follow.)

Ladder Safety half-day Webinar - 4th March

Food Safety in Pest Management half-day Webinar - 18th March

Bespoke technical training at your venue

To book any NPTA training, or for further information, please email maxine@npta.org.uk or call 01773 717716

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Public Inquiries an Overview

0113 245 0845 giles.ward@milnerslaw.com or uk.linkedin.com/pub/giles-ward/31/187/6b3 @MilnersGiles

Public inquiries can take audiences captive, enticing people in to see the government's official review of events/actions which are a matter of public concern.

Within this article we'll be looking through some of the more recent inquiries e.g. the Covid-19 inquiry/the Post Office inquiry. We'll be covering what they are set out/designed to achieve, the lengthy nature of some of these inquiries, who a public inquiry is led by and the costs of such.

Firstly, we must look at the overarching purpose of a public inquiry. Although it is said the Inquiries Act 2005 has 'determined the form and style of almost every inquiry since' (Institute for Government), instead we seek to find the answers to 3 key questions put out by Jason Beer QC. These questions ask; what happened? Why did it happen and who is to blame? What can be done to prevent this happening again? When looking at these questions we can clearly see the link to how these inquiries are set up, for example both the Covid and Post Office inquiries have numerous different phases or strands all looking at different sections of the public matter. When looking at the Post Office inquiry we can see that it perfectly encapsulates the goal of answering these questions, it begins in phase 1 with hearings focusing on human impact, the systems used, etc. and finishes in phase 7 by giving recommendations for the future. Speaking of these phases moves us onto our next topic, the lengthy nature of such inquiries.

These inquiries have literally tonnes of information to sift through and potentially make recommendations which could change an entire sector drastically. This of course means there is a lengthy timeline from start to finish for these inquiries, which may be one of the reasons as to why there have not been zero active public inquiries for more than 30 years. Public inquiries are known to be 'slow-moving beasts' according to the Institute for Government. Which can be seen as normally they average out at around 3 years or more to be completed. However, some can last much longer, the longest inquiry was looking into Hyponatremia-related deaths and took 13 years and 3 months to complete. Furthermore, when we look at the Covid-19 inquiry or the Post Office inquiry it is pretty evident to see this lengthy procedure even in the average inquiries. For example, the Covid-19 inquiry began on the 28th of June 2022 and is still ongoing to this day, the Post Office inquiry similarly started in 2022 but instead of June it was February. This inquiry has an estimation of reaching its final phase in spring/summer 2024. This could be seen as both understandable and infuriating for those more closely connected to such inquiries. This would be another two years without any procedural change/recommendation meaning those the inquiry is aimed toward may still be carrying out unfair practices. Interestingly a lot of civil claims are stayed / put on ice until the end of the inquiries meaning that again – people's lives are in a state of limbo.

When looking at public inquiries although they are initiated and funded by the government, they can be seen to be run independently. As they are run independently, they are led by a panel who is led by a chairperson. The choice of who this is to be belongs to the minster who initiated the inquiry, however there seems to be a tendency to favour judges. Where the chair is not from a legal background, they are instead drawn from professions with a high degree of societal trust according to the Institute for Government e.g. scientists, doctors, or teachers. This tends to potentially lead to a lack of diversity, typically meaning the chair is an older white male. This therefore runs into some of the issues the courts have about there being a lack of diversity meaning it could be said some communities/cultures have no voice within the overarching judgment or could even be potentially disregarded from thought when the decision is delivered, or at least feel that way.

Finally, there is another weighty factor- the costs. Such inquiries are known to be extremely expensive. According to the Institute for Government between 1990 and 2017 the UK and other developed nations spent at least £630 million on public inquiries. When we look at such a colossal amount of money and refer to the economy it may make people doubt the worth of these inquiries, especially while there has been a cost-of-living crisis raging and many UK citizens are struggling for the necessities. However, this could be argued against with the argument of them being for the greater good. Without these inquiries these concerning situations will continuously happen over and over to a staggering number of people. Therefore creating more problems in many different scenarios across different parts of the country.

In conclusion some may say the pros outweigh the cons, some may say the opposite. However, one thing cannot be argued, these massive inquiries are attempting to correct previous wrongs and create good in systems which may have had intrinsic flaws in them. Whilst the cynic in me would suggest that they are a convenient political tool for kicking problems well down the road and into the long grass whereby by the time they are completed in all likelihood there has been a change of government or at least a complete change of ministers they do non the less seek to get to the heart of problems and is one of the few forums where former Prime Ministers and senior civil servants can be brought to account for their actions.

Please feel free to contact me on matters relating to the above or indeed any legal issue you are facing in confidence on mobile 07789 401 411 or e mail giles.ward@milnerslaw.com

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Date	Venue	Cost plus VAT
BASIC PRINCIPLES OF PEST CONTROL		
Open Awards Level 2 Award in the Principles of Rodent Control		
16th April 2024	Ossett	* £165/£195
SPECIALIST COURSES		
Killgerm Principles of Insect Control		
17tg & 18th April 2024	Ossett	£190/220
PRACTICAL COURSES		
Trapping Techniques		
21st March 2024	Ossett	£165 Inc lunch
INSECT WORKSHOPS		
Insect Workshop 2 - Ants, Bees & Wasps		
19th March 2024	Ossett	£165 Inc lunch
Insect Workshop 1 - Bedbugs & Fleas		
20th March 2024	Ossett	£165 Inc lunch

Date	Venue	Cost plus VAT
EAST ANGLIA		
BASIC PRINCIPLES OF PEST CONTROL		
Open Awards Level 2 Award in the Principles of Rodent Control		
12th March 2024	Norwich	* £165/£195
Killgerm Principles of Insect Control		
13th & 14th March 2024	Norwich	* £190/£220
Insect Workshop 2 - Ants, Bees & Wasps		
30th April	Norwich	£165 Inc lunch
SPECIALIST COURSES		
Safe use of Air Weapons for Bird Control		
30th April 2024	Reading	£220 Inc lunch

Date	Venue	Cost plus VAT
BRISTOL		
SPECIALIST COURSES		
Drainage Investigations & Rat Control		
23rd April 2024	Bristol	* £165/£195
Killgerm Principles of Insect Control		
24th & 25th April 2024	Bristol	* £190/£220

Date	Venue	Cost plus VAT
BERKSHIRE & HAMPSHIRE		
BASIC PRINCIPLES OF PEST CONTROL		
Open Awards Level 2 Award in the Principles of Rodent Control		
19th March 2024	Newbury	* £165/£195
Killgerm Principles of Insect Control		
20th & 21st March 2024	Newbury	* £190/£220

Date	Venue	Cost plus VAT
SCOTLAND		
REFRESHER COURSES		
Pest Control Refresher/Update		
10th April 2024	Livingston	* £65/£165
SPECIALIST COURSES		
Bird Quano		
11th April 2024	Livingston	£130 Inc lunch
INSECT WORKSHOPS		
Insect Workshop 2 - Ants, Bees & Wasps		
9th April 2024	Livingston	£165 Inc lunch

ROYAL SOCIETY FOR PUBLIC HEALTH AND BRITISH PEST CONTROL ASSOCIATION - LEVEL 2 AWARD IN PEST MANAGEMENT FEE - £950 + VAT per person (includes Killgerm manual, RSPH Exam, lunch & refreshments)	
Venue: Ossett	
Units 1 to 3	Tuesday 11th June - Tuesday 18th June 2024
Examination	Wednesday 19th June 2024

ROYAL SOCIETY FOR PUBLIC HEALTH LEVEL 3 AWARD IN PEST MANAGEMENT. FEE - £850 + VAT per person (includes RSPH Exam, lunch & refreshments)
Venue: TBC
Training and Information day
Core Unit examination

ROYAL SOCIETY FOR PUBLIC HEALTH AND BRITISH PEST CONTROL ASSOCIATION - LEVEL 2 AWARD IN PEST MANAGEMENT FEE - £950 + VAT per person (includes Killgerm manual, RSPH Exam, lunch & refreshments)	
Venue: Scotland - Livingson	
Unit 3	Tuesday 10th & Wednesday 11th September 2024
Unit 1	Tuesday 17th & Wednesday 18th September 2024
Unit 2	Tuesday 24th & Wednesday 25th September 2024
Examination	Thursday 26th September 2024

For further information on any of these training courses or to book your place, call Lisa Wales on 01924 268445

Alternatively email training@killgerm.com or book online at www.killgerm.training

Some courses remain available online: **https://training.killgerm.com**

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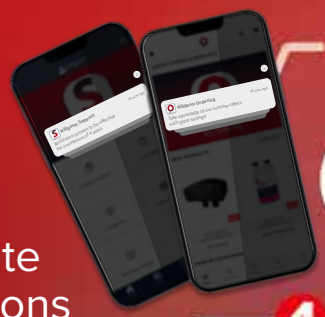

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