

pest

The independent UK pest management magazine

Bed Bug
Special 2019

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Issue 64
August & September 2019



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As the industry's only independent magazine, **Pest** aims to deliver a mix of unbiased news, impartial advice and topical technical features. We are committed to being as inclusive as possible covering every sector of the pest management industry.

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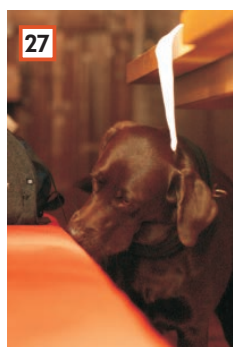
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What's around the next pest corner?

With the future surrounding Brexit still swirling around us, it's encouraging to see that the mood within pest control remains very positive. Pests are certainly immune to politics! Quite what effect our withdrawal from the EU will have is still uncertain – the biggest effect is likely to be on the price of imported products, your pest control products, should the £ fall further.

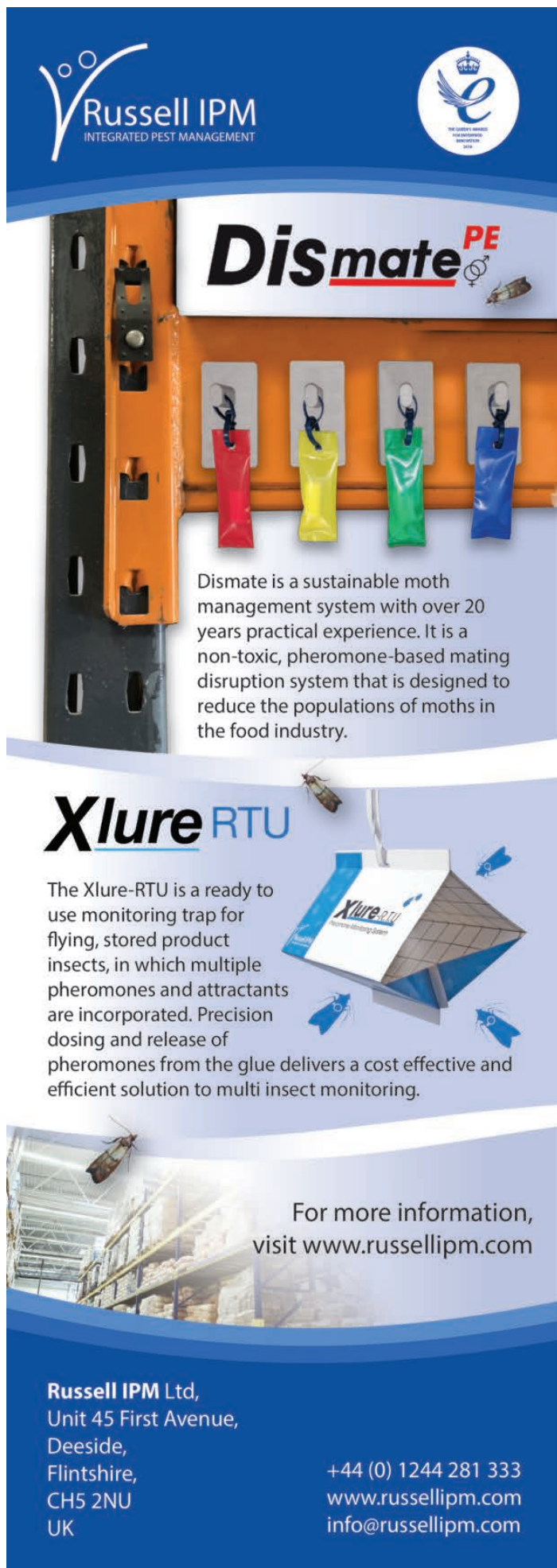
This uncertainty is not putting off the expansion plans of some pest control companies, judging by their plans for world dominance, as reported in this issue for both Rentokil and Terminix. Whilst closer to home, NBC has plans for expansion too. Listening to the Rentokil press conference, when the company's interim results were released, was very revealing, as reported on pages 12 & 13. At ground level, Rentokil often attracts considerable negative comment, but hats off to the top management for running a very profitable British-based company.

Once again, as has become something of an annual habit, we are delighted to include in this issue extensive coverage regarding bed bugs. They may not be the number one bread and butter pest for professionals, but they do still attract considerable research and product development. If the experiences of Mark Porter and his team are anything to go by (see pages 20 & 21), there are still some monster infestations out there.

With the autumn round of exhibitions almost upon us, we look forward to meeting as many of our readers as possible. Do come up and say 'Hello'.

Frances McKim

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Gull staring – new means of pest management?

Research at universities often isn't very widely picked-up by the media, but a release issued on 7 August by the University of Exeter certainly was! Upon examination the release said: "University of Exeter researchers put a bag of chips on the ground and tested how long it took herring gulls to approach when a human was watching them, compared to when the human looked away. On average, gulls took 21 seconds longer to approach the food with a human staring at them."

It is likely most professional pest controllers will agree that the presence of a human might deter a gull, but only for a very short time, if at all. However, the press picked it up and before you could say 'herring gull', staring at gulls became the means of fending them off your bag of chips. Films and photographs of gulls pinching food on seafronts were across every type of media, making a mockery of the research.



Gulls carrying superbugs

Elsewhere another piece of far more significant seagull research was revealed but not latched onto by the media. Researchers at Perth's Murdoch University in Australia, were looking at antimicrobial resistance in humans and animals and found that one in five silver gulls in Australia harboured antibiotic-resistant bacteria.

Some 562 samples were taken from the birds from different places around Australia and tested. The silver gull was selected for the study as it is the most common gull in Australia. The researchers were shocked to find high levels of antibiotic-resistant *E. coli* in the seagull samples. Researcher Mark O'Dea said: "Seagulls could be acquiring this pathogen through their opportunistic feeding habits where they scavenge from left-over human waste and may then be subsequently spreading these resistant bacteria over vast distances."

Moreover, many of these bacteria were actually clones of those found in humans in health care facilities. This confirmed that they had not been transferred from seagull to seagull, but through contact with human waste.

General Licence debate set to run

Things may appear to have settled down following the publication of GL34, GL35 and GL36 on 14 June but this is unlikely to be the end of this story. These new General Licences are only set to run until 29 February 2020.

Readers will remember that this whole saga started when WildJustice, mounted a legal challenge. The latest WildJustice newsletter explains that that first challenge has been parked but goes on to say: "We haven't given up, we haven't gone away and we are optimistic of securing significant changes to the General Licences that have allowed the casual killing of millions of birds." So more to come....

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Home is where the heart is

Big hearted Cobra Pest Control boss, Paul Gowland, has lent his support to a homeless charity in his home town of Sunderland. Paul explained: "In the twilight and early morning hours, we see a lot of people huddled in doorways bundled in their rags and cardboard. It's easy to judge them, but they all have different stories and circumstances leading to their current plight. When we heard about Sunderland Community Soup Kitchen we were eager to help in any way we could.

Founder Andrea Bell says: "Paul and his team's help has been colossal. Not just financially but, more importantly, by making resources available to help us get set up. Time is often the hardest thing to give, but the boys at Cobra have been there every time. We have achieved a five star food rating at the first attempt with Paul's help and just having someone who I can call any time to bounce ideas or problems off is an immeasurable help to us."

Paul added: "Andrea is a remarkable lady and her dedication to helping the less fortunate people in our city is amazing. We are looking forward to supporting this charity. There are other initiatives we are working on with Andrea to help raise funds and awareness. If we all put a little back, then some of the social issues facing many communities will benefit immensely and apart from that it makes you feel good about yourself!"



Paul Gowland with Andrea Bell

Two in at once....

Colin Lee-Dade, pest control officer for Dacorum Borough Council in Hertfordshire, thought he would give the Tri Kill mouse trap from the Victor range, sold by RatPak a try. He had been having persistent problems with mice getting in under the floor into the kitchen units in a domestic property. The traps and bait were down for three weeks. The first week two mice were in the traps, the second week two in one trap and after that none! Job done!



Abate to the rescue

The spell of very hot weather at the end of July threatened to wreck a ground-breaking art installation, called Flight for Youth, put on by a local Norfolk and Suffolk charity, the Benjamin Foundation.

The heat was destroying the display which consisted of thousands of glazed pottery butterflies put in place at the Assembly House in Norwich to mark the charity's 25th anniversary. Every butterfly was attached to the structure with a glue backing, but with the extraordinary hot weather a few butterflies decided to try and escape when the glue melted causing the fixings to come away from their ceramic backs. This is where Morley St Botolph-based Abate leapt to the rescue.

Colin Lang from the Benjamin Foundation said: "We needed to act very quickly to secure the butterflies and I thought netting would be an ideal solution. I contacted Jon Blake the MD of Abate Pest Management who dropped everything to assist.

"Within hours, Abate carried out a survey, they then sourced specific netting from one supplier and ties from an electrical contractor and were ready to implement a solution."



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Another twist in the Rentokil-Mitie saga

Readers will be aware that Rentokil announced the intended acquisition of Mitie's pest control business on 1 October 2018 and that on 12 April 2019 the Competition and Markets Authority (CMA) decided this might result in a substantial lessening of competition, particularly to national customers in the UK market.

However, an interim announcement on 11 July on the CMA website took the industry, and the companies involved, by surprise. ServiceMaster Global Holdings Inc was named as the upfront buyer of the business Rentokil was offering to divest to satisfy the CMA's competition concerns.

ServiceMaster, based in Tennessee, USA, is an international company with turnover of nearly £2 billion in 2018. It is very well known in the US via the Terminix brand. Those with long memories will recall that Terminix used to have a presence in the UK, but that business was sold to Ecolab in 2012.

What most did not realise (and was divulged on the CMA website), is that ServiceMaster already has a presence in the UK and Irish markets as the company has recently purchased Pest Pulse, a technology-based pest control company based in Dublin, whose UK director happens to be Peter Trotman, ex MD of Mitie Pest Control.

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ICUP Call for papers

If you are involved in urban pest management research, or, perhaps, have a more practical case study that has lessons to share, now's the time to speak up. The organisers of the International Conference on Urban Pests (ICUP) 2020 are looking for topics to be presented at their next event to be held in Barcelona, Spain. But hurry you only have until 16 September 2019 to submit your abstract via the ICUP website.

www.icup2020.com

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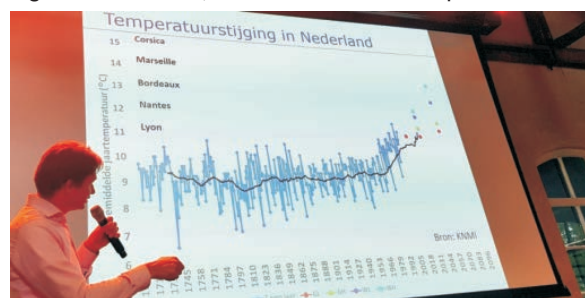
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World Pest Day

World Pest Day was initiated in 2017 by the Chinese Pest Control Association. It is co-sponsored by the Federation of Asian and Oceania Pest Managers' Association (FAOPMA), the USA's National Pest Management Association (NPMA), and the Confederation of European Pest Management Associations (CEPA). The aim is to create a multinational event to raise awareness among the public, government and media about the work that pest control professionals do on a daily basis to ensure public health and safety. With this lofty aim and these organisations behind it, it's a shame more has not been made of it, so far.

Originally it did receive a higher profile but in Europe this year it seems to have rather slipped under the radar, with a few exceptions. In the UK, the British Pest Control Association (BPCA) launched a campaign targeting local authorities and urging them to put pest management firmly on their agenda. BPCA highlighted the threat to society, and particularly public health caused by infestations and sent them a pest management toolkit.

On a rather grander scale, on 6 June the Dutch pest control association, NVPB, with PLA..N together with KAD (Dutch Pest & Wildlife Expertise Centre) and Dutch *Pest Control News* organised a free symposium at the Dutch open air museum in Arnhem. Over 100 pest professionals attended.



The theme was 'Pests: a world in movement' and presentations were given covering globalisation, climate change and the variation in urban pest problems.



Farewell John Kaye

Although he retired from his role in the Killgerm technical department in 2007, many in the industry will remember John Kaye and be sad to hear that he has passed away.



Prior to joining the pest control industry, John served in the Royal Navy for seven years, before joining Rentokil as a service manager followed by a spell as a senior technical officer at Wakefield Council. In 1990 he joined the technical department at Killgerm where he stayed until his retirement.

During his long service at Killgerm, John advised and trained many pest controllers who greatly appreciated his counsel. He was a fellow of the Royal Society of Health and in 1997/8 was President of the British Pest Control Association.

Matthew Davies of Killgerm Chemicals commented: "I was lucky enough to spend my formative years at Killgerm alongside John and it was a real pleasure to work with him. As well as being a font of knowledge he was a true gentleman. He will be dearly missed. We offer our condolences to John's family, friends and industry colleagues."

Away from work he is remembered as a loving husband, a caring and proud father (son and daughter) and grandfather.

Funds secured by NBC Environment

Another company with bold expansion plans is Norfolk-based NBC Environment which has obtained £1.2m funding from Santander to boost the company's growth.

The press release explains that as a result of a successful extensive review of NBC's business model, the company has secured a funding package with Santander. With over 26 years' experience, NBC has grown to become a leading pest control and wildlife management company in the UK. The financial support and accelerated growth strategy will enable NBC to continue to explore further opportunities in the industry.

A bevy of beauties join PelGar International

At the PelGar HQ, Lauren Hypson has joined the regulatory team as a regulatory officer to support registrations work. Previously Lauren worked at HSE in the Chemical Regulation Division focussing on human exposure risk assessments before working in the project management team.

Rhian Strothers has joined as regional sales coordinator for Europe to work alongside the business development manager, Vincent

Russo, assisting in managing the ever expanding portfolio of customers as well as dealing with internal processes and administration duties. Previously Rhian worked in a variety of sales and marketing roles in industries such as fire and security, health and safety and gas detection.

At PelGar's Church Farm Training Centre, Maddie Lindsay has joined as the new unit supervisor responsible for preparing and carrying out insecticide tests and supervising

the animal technicians. She previously worked in insect husbandry at Southampton and Oxford Brookes Universities.

Having worked professionally with horses and then gained a Level 3 Animal Management Extended Diploma and with a passion for behavioural enrichment, Chloe Mould has joined to work with somewhat smaller animals as an animal technician caring for Church Farm's rodents and insects.



Lauren Hypson



Rhian Strothers



Maddie Lindsay



Chloe Mould



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Permanent baiting indoor guidance relaxed

The guidance on permanent baiting issued by the Campaign for Responsible Rodenticide Use (CRRU) in September 2018 has been changed. Where indoor permanent baiting has proved necessary, the frequency of inspections is now down to the pest professionals' expertise. Previously, as with outdoor permanent baiting, inspections had to take place at intervals of at least four weeks.

The new guidance document, dated July 2019 can be downloaded from the CRRU website and the **Pest** Library. It now clearly distinguishes between the indoor and outdoor use of permanent baiting. This is a great step forward and one which should be welcomed by pest professionals, as it takes on board the very real differences in risk to wildlife from outdoor and indoor infestations.

The update for indoor locations only specifies that the frequency of routine inspections and re-visits when target pest presence is indicated are a matter for the pest control technician in charge of the control programme. This update comes about in response to feedback from professional pest controllers at a British Pest Control Association (BPCA) forum.

Unchanged, is that permanent bait points outdoors continue to require re-inspection at least every four weeks. Professional rodenticide users are also reminded that permanent baiting in any location is permitted only using products with labels specifically stating such use is allowed.

The new document contains a completely new section explaining indoor permanent baiting and why the risks are lower. This includes:

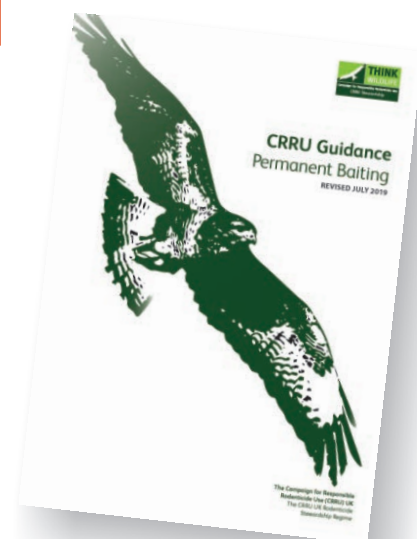
- Indoor permanent baiting is generally used to combat house mice with bait stations designed to only allow entry to

animals that are the same size, or smaller than a mouse;

- Few non-target animals can gain access to the bait;
- Only small quantities of rodenticide are used;
- Non-target animals are usually virtually absent from indoor baited areas;
- The risks to human and animal health from indoor infestations are greater making the risk:benefit calculation more likely to be in favour of permanent baiting;
- Similarly the commercial risks from a breach of quality assurance standards are higher if the rodents are found inside premises than if they are discovered outdoors.

It also points out that for many house mouse infestations, in both domestic and commercial premises, it is impossible to present bait to the entire infestation. This means the potential for reinvasion is high, for example where an infestation is common to several properties with access through communal loft spaces and/or wall/floor/ceiling voids. In such cases a permanent baiting regime is essential.

In such circumstances pest professionals will need to visit the site frequently at first to establish the size of the problem and adjust the bait points accordingly. The frequency of



follow-up visits however will depend on the particular circumstances of the infestation and for this reason it is now down to the pest professional in charge to decide when these will be required, taking account of the risks identified in the site survey. When signs of activity are found in permanent bait boxes, the pest management programme will need to be adjusted to deal with the problem and this is likely to then require more frequent visits.

For both indoor and outdoor situations, CRRU chairman, Dr Alan Buckle, emphasises that the fundamental requirement remains that the professional rodenticide user responsible for the site must have identified and documented 'a high potential for reinvasion where other methods are insufficient' before choosing to introduce permanent baiting. Permanent baiting should not be used as a routine practice.

It's good to see that those involved in the management of the Campaign for Responsible Rodenticide Use (CRRU) are open to ideas from others in the industry and prepared to take action when best practice guidance needs to be changed.

Everyone involved in CRRU is from our industry and, contrary to the belief of some, CRRU's objective is not to make life as difficult as possible for those at the sharp end of pest management.

Jersey to adopt UK stewardship regime

The Government of Jersey is introducing rodenticide stewardship covering the sale and use of professional rodenticides, modelled on the Campaign for Responsible Rodenticide Use (CRRU) UK's regime. Jersey's Growth, Housing & Environment department has announced that stewardship point-of-sale competence checks will be introduced from 18 July 2020, with CRRU assisting in the preparations required.

The professional use rodenticides on sale in Jersey are supplied from the UK and already have the appropriate HSE and stewardship labelling. In common with UK, the Jersey authorities are vigilant to prevent non-UK, and therefore non-stewardship, products being sold on the island.



Rodenticide resistance: Will you help fill the gaps?

Resistance is everywhere! Or is it? Clare Jones and Montse Talavera from the Vertebrate Pests Unit at the University of Reading need your help to find out! What's more if you live in an area of the UK where they have insufficient data you can get sophisticated DNA analysis done for the price of a postage stamp meaning you will get the results you need to be sure what you are dealing with, as Clare and Montse explain.



Reading University's Vertebrate Pest Unit (VPU) is using DNA analysis of tail samples to map the presence and absence of resistance mutations in Norway rats and house mice – see maps below of results so far.

Across the UK there are five major mutations in Norway rats and two in house mice. Each mutation confers resistance to different anticoagulants and this makes controlling these populations difficult. It is important to know which mutations you have so you can use the most effective rodenticides to get the

job done as quickly as possible whilst, at the same time, avoid releasing unnecessary toxicants into the wider environment.

Unfortunately we still have large areas of the UK where we have very few or no samples at all. Is this because there is no resistance and pest professionals are not having difficulties in controlling rats and mice in these areas? Or is it simply because we are not attracting enough involvement in the project?

The Rodenticide Resistance Action Committee (RRAC) is funding the

anticoagulant resistance project so all you need to do if you work in an area where we have no data is send samples to use here at the VPU at Reading University. We will DNA test each tail and send the results directly to you. All free of charge!

Table 1 lists the English counties where we do not have any samples. If you live or work in any of these places we want your tail samples

Data for Scotland and Wales is very thin on the ground such that it is easier to list the counties/districts where we already have

Resistance mutations for Norway rats



VKORC1 mutations in the Norway rat

Susceptible	L120Q	Y139F	Y139C	L128Q	Y139S	L120Q & L128Q
◆ Homozygous	◆ Heterozygous	◆ Heterozygous	◆ Heterozygous	◆ Heterozygous	◆ Heterozygous	◆ Heterozygous
◆ Homozygous	◆ Homozygous	◆ Homozygous	◆ Homozygous	◆ Homozygous	◆ Homozygous	◆ Homozygous

Resistance mutations for house mice



VKORC1 mutations in the house mouse

Susceptible	Y139C	L128S	L128S & Y139C
◆ Homozygous	◆ Heterozygous	◆ Heterozygous	◆ Heterozygous
◆ Homozygous	◆ Homozygous	◆ Homozygous	◆ Homozygous

samples, see table 2. If you work anywhere else in Scotland or Wales then please get involved. There is no data for Northern Ireland so, again, please send us your samples.

By doing so you will be providing us with essential information that will allow us to not only understand the spread of resistance, but also help us provide advice on which products will work for you in your area.

Table 1: England

Tail samples from the following districts/counties are virtually guaranteed to be free as data is lacking.

North West:	Blackburn with Darwen
	Cumbria
	Halton
	Merseyside
	Warrington
North East & Yorkshire:	East Riding of Yorkshire
	Darlington
	Hartlepool
	Middlesbrough
	Northumberland
	Redcar & Cleveland
	South Yorkshire
	Stockton on Tees
West Midlands:	South Gloucestershire
	Telford & Wrekin
	Warwickshire
East Midlands:	Derbyshire
	Leicestershire
	Lincolnshire
	North East Lincolnshire
	North Lincolnshire
	Nottinghamshire
	Rutland
Eastern England:	Bedfordshire
	Milton Keynes
	Luton
	Peterborough
	Southend on Sea
South West:	Thurrock
	Bath & North East Somerset
	Somerset
	Bournemouth
	Cornwall
	North Somerset
South East:	Poole
	Torbay
South East:	Brighton & Hove

Table 2: Scotland and Wales

Data is lacking for nearly all of Scotland and a good deal of Wales. The districts/counties with some data are listed below; anywhere else and free testing is virtually guaranteed.

Scotland:	City of Edinburgh	Wales:	Camarthenshire
			Monmouthshire
			Pembrokeshire
			Powys
			Wrexham

How to get your FREE test

Think you've got some suitable sites? **BEFORE** you do anything, email the Vertebrate Pests Unit (clare.jones@reading.ac.uk) with the post codes of the sites you want to collect tails from. We will tell you whether you are already near an existing data point and will be happy to give you advice.

Collect between one and three tails per site - see how below. If a tail fails testing you will be invited to send up to a maximum of three replacement tails.

Collect tails from dead bodies and, preferably, from trapped rodents. Fresh, clean and intact bodies are needed for tests to work. If you suspect a body is more than three days old and is not of good quality, do not use it.

Three easy steps:

1 Cut

- A tail tip (2-3 cm) is required to provide DNA from each rodent. Each tail tip must be removed using a clean blade or sturdy scissors.



2 Bag

- Tails should be stored in a sealable plastic bag (e.g. Zip-Lok);
- Please put each tail in a separate bag;
- Use our template as a guide for labelling your bagged tails:

Name: [Your name]
Date: [Date the tail was collected]
Species: [Norway rat / House mouse]
Site Postcode: [Postcode of the site or GPS co-ordinates]
Email: [Your personal or work email]

3 Post

- Once the tail sample has been placed in a bag, it should be sent to the University of Reading for DNA testing OR if you can't post it the same day put the tail in a freezer (within 12 hrs of collection) until it can be posted;
- An exact location must be provided with a sample (GPS co-ordinates OR a post code) otherwise it cannot be processed. Please include your email address so we can contact you with the results;
- The samples must be labelled correctly and packed in a way that samples cannot be touched by unauthorised people.

Please note: If your samples are from a location within a 5km radius of an existing data point then they cannot be analysed free of charge. If you would like to check whether you are near any resistance go to RRAC's online interactive questionnaire and map: <http://guide.rrac.info/resistance-maps/resistance-maps>

RRAC funding is not unlimited so get involved and help us fill in the gaps now!

Visit our web page for more information: <https://research.reading.ac.uk/resistant-rats/>

A glimpse into the financial workings of Rentokil Initial

On 31 July 2019 Rentokil Initial held a conference in the City of London for members of the press and financial analysts where the company revealed its very credit worthy interim results – as shown right. Whilst **Pest** was not at the event, it was broadcast live via webcam so it was possible to pick-up on the nuances in the presentation and hear what questions the analysts asked. Recorded here are some of the points we thought readers would be interested to hear about.



Chief executive, Andy Ransom

Chief executive, Andy Ransom, led the presentation, ably supported by Jeremy Townsend, the company's chief financial officer, who was in command of the financial figures.

Within these pages we have commented before on the significance of the pest control division. This is the company's shining star and, alone, accounts for 64% of group revenues (compared with 29% in 2013) clocking-up £818m in revenue and £135m of profit. This division achieved spectacular ongoing revenue growth of 11.4% of which 4.8% was organic growth.

The hygiene side of the business accounts for

22% of revenue and what Andy refers to as 'low margin business', Protect & Enhance (basically France workwear, Ambius and UK Property Care) accounts for 14%. A long way from the days when Rentokil was very much 'all things to all men' in the services sector.

Mergers and acquisitions driving growth

Much of the growth within pest control comes, and will continue to come, from mergers and acquisitions. During the first half of the year, 17 businesses were acquired, of these 12 were in pest control and five in hygiene. Of the 12 pest control acquisitions, seven were in North America – obviously a key target market. Andy revealed that £250m was earmarked for the full year for acquisitions. He explained that the company, as a whole, has a team of seven to eight global staff working on mergers and acquisitions saying: "We have huge experience in acquisitions and we adopt a very disciplined financial approach. We have a templated and systemised process that we work to. A 'budget' of £250m may be earmarked for acquisitions but it doesn't mean it will be spent simply to spend it, nor is this the limit should the right business come along."

Neither in the presentations, nor in the subsequent questions from the audience, was there a single mention of the acquisition of Mitie Pest Control Ltd, nor was there any comment about the likely outcome of the ongoing investigation by the Competitions and Markets Authority.

The attraction of pest control as a business sector was explained by Mr Ransom saying: "Pest control is a non-cyclical, sustainable growth market which we estimate to be worth c. \$20bn

2019 at a glance Interim results

- Revenue up 8.8% to £1,298.9m
- Ongoing operating profit up 11.6% to £152.1m
- Organic revenue growth of 4.2% equals the highest growth rate in the first half for over a decade.

by the end of 2019, growing at c. 5%. Rising consumer expectations, growing middle classes, urbanisation, increasing workplace and food regulation, climate change and increasing pest pressures assure a rosy future for commercial pest control."

Yet it is a highly fragmented industry, one often described as a distress purchase, it is estimated there are 40,000 companies, 50% of which are in North America. Rentokil's global presence is quite astounding, as it estimates it is the number one pest control company in over 50 of the 80 markets in which it operates. He proudly declared: "Our powerful Rentokil brand is one of the world's top 50 most valuable and recognisable brands," as identified in the Brand Finance Report 2017.

The company's plans for North America remain bullish with a revenue target of \$1.5m by 2020 and net operating margins of 18% planned for delivery by the end of 2021. To give these figures some scale, this would in fact be double Rentokil's existing revenue in the US and equal to that of the second largest pest control company in the US (Terminix), according to the figures presented in the annual PCT Top 100 company report.

Andy stated that Rentokil national accounts were the 'sweet spot' of the company's North American business when compared to 'jobbing' work, but did admit that season dynamics could lead to higher margin work. "Sometimes we are so busy and we can't get everything done, so we operate a dynamic price schedule," he explained. No surprises there then!

Whilst the company's low cost operating model by which it is managed, known colloquially as 'the machine' was referred to, two specific sectors were highlighted. First company staff, or as Andy described them,

the primers of the business. He explained how every meeting at Rentokil, right from board to branch level, starts with SHE (Safety, Health and Environment): "There is nothing more important than every single one of our 40,000 people goes home safe every day. In my view there is a clear and direct correlation between a business that attains the highest safety standards and one that delivers excellent financial performance. We have made dramatic improvements over the last five years and now our safety performance is at world class standards."

People are key

A second initiative, begun two years ago was also detailed – known as Employer of Choice. This is the second agenda item at meetings. "For this we also have a set of consistent measures. People will have heard me say before – Our people agenda is the most critical strategic imperative we have in Rentokil Initial – or put simply, if we get our people agenda right, we have a fantastic opportunity to execute our plan and to create value for our shareholders. If we don't get our people agenda spot on, then it doesn't matter how good our plan is we wouldn't be able to execute it."

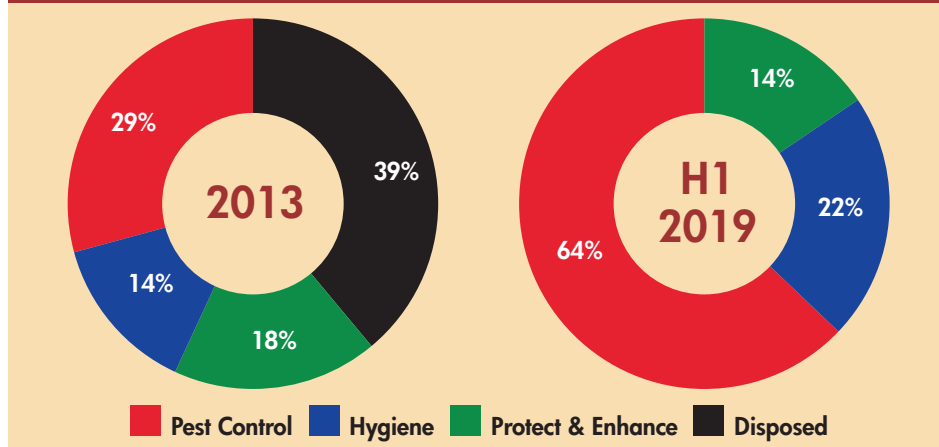
Fine words indeed, let's just hope the local Rentokil technician sitting alone in his van, on which the execution of the business rests, recognises this sentiment.

Rentokil's advances in digital technology were covered. The company claims to be the leader in this sector and Andy quite unashamedly said the aim was to improve productivity, so reducing costs. He sees pest control as an ever more sophisticated market with higher barriers to excellence, so digital applications offer a means of protecting core markets, differentiating service and responding to customer needs. Examples quoted were the range of Lumina LED insect light traps where Rentokil was first into the market (now sold in 42 markets worldwide), plus a series of remote monitoring rodent systems, such as Dual AutoGate Connect.

Now with two directors in place responsible for digital products and artificial intelligence (AI) there appears to be much on the horizon with a whole series of trial products using AI underway. One of these is known as PestID, an image-based smartphone App that allows a technician to take a photo, send it in for identification, then PestID will recommend the best means of control, plus sending a training or safety video.

But, is this not what trained and qualified professional pest technicians are supposed to be able to do for themselves?

Rentokil Initial business sector split – 2013 v 2019



Rentokil's growing presence in the vector and mosquito market was detailed. Andy said: "Mosquitoes are the biggest killers on the planet. There are over 3,500 mosquito species. The vector market is estimated to be worth \$4.4b and is growing at 7% per year. Rentokil is ideally placed to grow our presence in this market. In the last two years we have acquired two companies in the US (VDCI and Mosquito Control Services) and one in Brazil (Multicontrol) and just last month Ecovec, also in Brazil."

Lucrative mosquito work

In the Q&A session more was revealed. Andy said that the mosquito vector market, whilst huge, was complex and he saw it very much as a medium-term prospect. He explained how in the US it is very 'lumpy and sporadic' – the company's fleet of planes might do nothing for weeks, but then after heavy rain when mosquitoes are breeding be called upon as an emergency situation and work around the clock. In such situations the margins were very lucrative.

He estimates the company only has a 1%

share of this sector and if all Rentokil vector revenues globally were put together the total was around \$50m, but growing at 10% organically. He said there were few companies with the expertise and global reach to address this market. Agreed. What he did not say though was that whilst financially rewarding, the market Rentokil is most involved in is the high value control of mosquitoes for e.g. via aerial application, whereas the greatest demand for control lies in the less developed and financially strapped markets where aid-funded and WHO managed work proliferates.

For those readers with an interest in the fortunes of Rentokil, listening to this hour long webcast is highly recommended. At no other time would you have the opportunity to hear, first hand from the captain of the ship when he is putting his best foot forward to impress the financial markets with details about how the company functions. It can be found on the Rentokil Initial corporate site at www.rentokil-initial.com where listeners first have to register.





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Conservation in partnership – Samoa update



In **Pest 55**: February and March 2018 we ran a feature on one of PelGar's Conservation in Partnership (CiP) initiatives on the Pacific island of Samoa. We are delighted that PelGar has now updated us on progress.

Working with Auckland Zoo and the Samoa Conservation Society, PelGar International is providing support in the form of rodent bait stations and difenacoum rodenticide (Roban) to reduce the rat population in the Malololelei Reserve on the island of Upolu. The objective is to protect the critically endangered manumea, also known as the 'little dodo', the national bird of Samoa.

Gerwyn Jones, PelGar's business manager for the Asia Pacific Region, is pleased to report: "We are encouraged to hear that the bait take by the rats has been good, and that the local people have anecdotally heard more bird song in the area. There is even a piece of video footage from a wildlife



PelGar's Gerwyn Jones at the Malololelei reserve on Samoa



Black rat captured entering bait station using infra-red camera trap equipment

camera that shows a black rat entering the same station and feeding on the bait over three consecutive days. On the fourth day there is no sign of the rat, which no doubt has succumbed to the Roban rodenticide.

"The team at Auckland Zoo and the staff of the Samoa Conservation Society are doing a fantastic job. Even though the main goal is to bring the manumea from the brink of extinction, other native Samoan species are also being protected, such as the ma'oma'o bird," concludes Gerwyn.

PelGar is now involved in conservation work with a community based organisation, Falease'ela Environmental Protection Society (FEPS), on another part of the island in Samoa, in an attempt to save the manumea from extinction. In addition, one of PelGar's partners, Tenv Solutions has provided the rodent bait stations, at no charge, to help with this new project.



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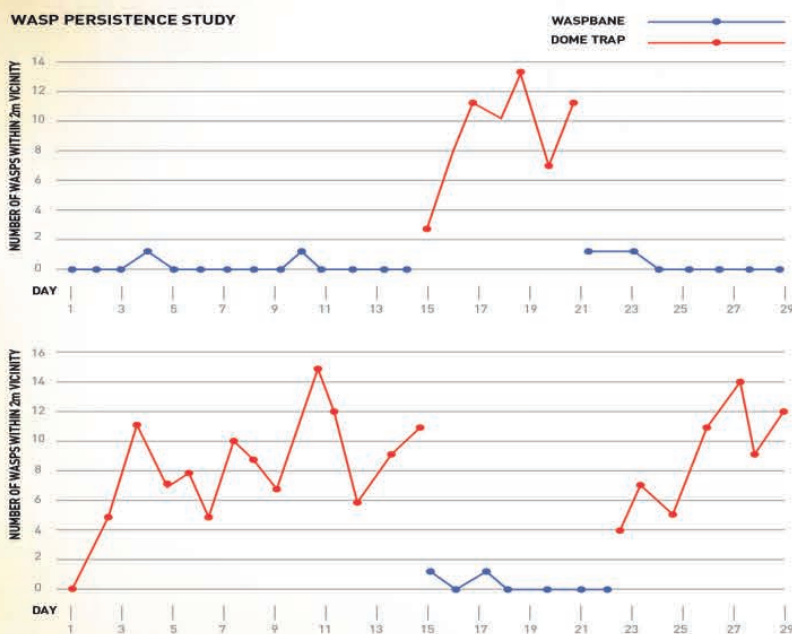
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Local authorities most likely to be involved in bed bug treatments, reveals survey

Across the ten years of the National UK Pest Management Survey, bed bug work has always taken up around 4% of the average pest professional's time but does this average hide important differences? The benefit of **Pest** working with market research specialists, Research Engine, on the survey has meant that this year we have been able to pull out some bed bug specific data.

We were curious to know whether there was any evidence to support the perceived wisdom that bed bugs are becoming a more specialist work area and that only the bigger companies and local authorities are involved.

We already know that, unlike rodents, which are tackled by almost all pest professionals, not everyone does bed bug work. But, it turns out that over 70% of our self-employed pest controllers do get involved in bed bug treatments. That said, it is clear from the data that it is local authorities that are most likely to be called on to do bed bug treatments, closely followed by private companies.

Geographically we were interested to see if bed bug treatments were concentrated around major cities. From the data we collect it's not possible to answer this question in detail, BUT it seems likely that cities, and the concentration of people in them, does correlate directly with bed bug infestations. All pest professionals based in central London carried out bed bug treatments and the percentage of time spent at 11.9% is almost three times the average.

Good news however, if you're planning on taking a holiday down in the South West, as this region has the lowest average time spent treating bed bugs.

Interestingly, the data shows that those NOT involved with bed bugs seem to treat fewer species overall compared to those that do and, what's more, they are generally a little more pessimistic about the future. Maybe this is because they are treating fewer species. This group is also more likely to be self-employed.



Finally those treating bed bugs are more likely to be a member of BASIS PROMPT and/or BPCA registered.

Bed bugs were mates with Tyrannosaurus rex



Professor Mike Siva-Jothy

Work by an international team of scientists, including researchers from the University of Sheffield, have compared the DNA of dozens of bed bug species in order to understand the evolutionary relationships within the group, as well as their relationship with humans.

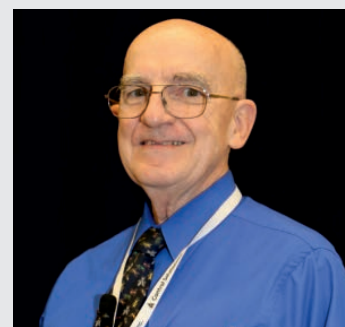
The team discovered that bed bugs are older than bats – a mammal that people had previously believed to be their first host 50-60 million years ago. Bed bugs in fact evolved around 50 million years earlier.

The team spent 15 years collecting samples for DNA testing from wild sites and museums around the world and have now discovered that the evolutionary

history of bed bugs is far more complex than previously thought. Bed bugs it turns out actually existed during the time of the dinosaurs. More research is needed to find out what their host was at that time, although current understanding suggests it is unlikely they fed on the blood of dinosaurs.

Professor Mike Siva-Jothy from the University of Sheffield, who was part of the team, said: "To think that the pests that live in our beds today evolved more than 100 million years ago and were walking the earth side-by-side with dinosaurs, was a revelation."

Dr Steffen Roth from the University Museum Bergen in Norway, who led the study, added: "The first big surprise we found was that bed bugs are much older than bats, which everyone assumed to be their first host. It was also unexpected to see that evolutionary older bed bugs were already specialised on a single host type, even though we don't know what the host was at the time when T. rex walked the earth."



Dr Harold Harlan

The bed bug granddad

If Dr Richard Naylor is making his mark in the UK (see pages 22 & 23), he still has some way to go compared to one of the most recognised bed bug authorities in the industry – Dr Harold Harlan. He has nursed his own colony for nearly 50 years.

Harold fell into pest control's clutches by accident. The fifth of six sons of a tenant farmer from rural Ohio, he initially thought his future lay in agriculture and enrolled at the Ohio State University. It was here he discovered his love of entomology and, when offered the opportunity to work at the University's insect museum, he learned the value of collecting and preserving insects.

The Vietnam War coincided with his time at university, so he was commissioned into the US Army as an entomologist and saw service not only in Vietnam, but also later in Saudi Arabia during the Gulf War. It was here he came face-to-face with all sorts of insects and the diseases they transmit.

But it was a call-out to troops reporting unusual bites at Fort Dix in 1973 that started him down the bed bug route. The mystery bugs were bed bugs, but Harold discovered little was known about them, there were few samples to compare them with and treatment options were sketchy. So began his life-long fascination with this pest.

To this day, ensconced in his own home are descendants of the bugs collected in 1973. Like, Richard, they too are fed on his own blood. This makes them unique and they are the 'go to strain' for researchers looking for totally susceptible bugs for trials. The strain has come to be known as the Harlan strain.

Now a confession from the editor of **Pest**. When bed bug strains are referred to, they are usually named after the location where they were first collected – e.g. the Monheim strain from Germany, the Sydney strain from Australia and what the editor thought was the Harlem strain from New York. It came as quite a shock to find that it was the Harlan strain! So it was a great pleasure, at long last, to meet in person this kind, self-deprecating icon of the industry.

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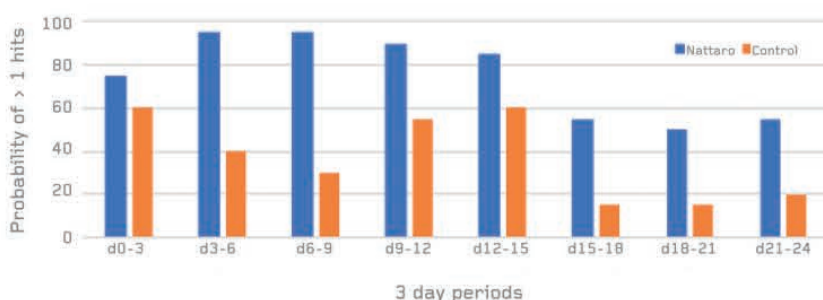


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New product developments...

At this time last year we reported on several new bed bug products 'just around the corner'... so what progress? Are they about to arrive at a distributor near you? In short... once more...not yet!

Aprehend – fungal spray

For the last two years we have reported on the progress of Aprehend, discovered initially by Nina Jenkins at Penn State University, USA and now commercialised by spin-off company, ConidioTec. To recap, the active ingredient in Aprehend is a natural fungal disease of insects called *Beauveria bassiana*. It is applied as a spray and remains effective, says the manufacturer, for up to three months.

Sales began in the US in 2017 and the product is now registered in virtually all States. But what about international sales? Don McCandless, ConidioTec CEO replied: "As yet there are no sales outside of the US, but Canada is all go for spring 2020. We have had trials in Singapore and considerable interest in the Middle East. As for Europe, we are still exploring regulatory requirements and potential partnerships. To be honest, we have just been trying to keep up with demand in the US, which is a good problem to have," concludes Don.



Don McCandless

Deal on the horizon for pheromone lure

Again last year we reported that a grant of £220,034 had been won by Vectotech, the spin-off company from the London School of Hygiene & Tropical Medicine (LSHTM). The funds are to help the commercialisation of a new bed bug aggregation pheromone the LSHTM had identified.

So what progress? An update was provided by Dr Victor Brugman, Vectotech's head of development & partnerships who said: "A novel, sensitive, long-lasting bed bug lure prototype has been developed designed for use in monitoring devices to detect small numbers of bed bugs, such as during an early stage infestation, or post treatment to ensure efficacy.

"The proprietary lure contains critical components of the natural aggregation pheromone that is produced and used by bed bugs to locate their safe harbourages after feeding on their sleeping human hosts. It is particularly sensitive, as it attracts both sexes and all mobile life stages and has been formulated to last for at least three months.

"Vectotech anticipates closing a deal with a major global pest control company in the near future to conclude development and manufacture of the products," concludes Victor.



Dr Victor Brugman

Coming to a screen near you... maybe

Last year we recorded the launch of Delta Five elure. Put simply, this three inch high box works as an electronic attractant for bed bugs. Using computer vision it detects the bed bug, traps it and then the WiFi connected device instantly sends a text or email – very like the operation with rodent boxes.

The box itself is dark with a narrow slot, so is designed to appeal to bed bugs. It also has a heated surface to simulate human skin and within the box is a natural attractant.

As is rather the case with ConidioTec, Al Safarikas, in charge of marketing at Delta Five said: "We have focused our efforts exclusively in the US over the last ten months. Our efforts have met with success in that the Delta Five Automated Bed Bug Detection System, has over 15,000 devices installed at over 70 properties. We have protected over seven million guest-nights from beg bug bites."

As for sales outside the US, some have been made. As for Europe, discussions are in progress with potential partners.



UK version?

Word on the block is that a somewhat similar product is in the last stages of development by a UK company and that a launch this autumn is forecast.... Fingers crossed!

Bugs in hotel bedrooms

Specific research concerning a loss of reputation for hotels if bed bugs were located in hotel rooms was undertaken by Dr Michael Potter from the University of Kentucky, USA and reported in **Pest 58**: August & September 2018.

Nearer to home, the London-based End of Tenancy Cleaning Service has just surveyed 1,448 British tourists who have booked a trip this summer to identify the cleanliness issues they would most likely complain about should they encounter any in their hotel room.

The survey found that the majority of Brits feel inclined to complain if they can clearly spot stains on the bed (e.g. linen, mattress etc.) and towels (81%) of their hotel room. (Editor's note: Bed bug faecal deposits maybe?)

Although this was a much more general survey there were some results relating specifically to pests.

81% of Brits who found an infestation of bed bugs, flies, rodents and/or wasps/bees in their room, would immediately ask hotel management/employees to be moved to another room. Having once complained about the infestation of these pests, 73% would expect the hotel to offer them a sufficient partial, or full refund, for the inconvenience caused.

Interestingly, 65% would 'certainly' leave a negative review of the hotel if they were not satisfied/happy with how this infestation of pests in their room was resolved by the hotel's management/employees.

Lessons from a mega bed bug job



Mark called in Peter Bowers-Davis from Integrum Services for help with the job



Pest bumped into Mark Porter of Porter's Pest Control earlier this year at PestEx

It's the biggest bed bug job this pest professional has ever seen and the way he tackled it makes interesting reading. But, more than that, his decision to live stream the way he approached it, demonstrates the amazing power of social media.

Mark Porter of Porter's Pest Control cut his teeth with Prokill, first as a technician then in a sales role. Around two and half years ago he decided to set up his own business covering the whole of London. He's not looked back. From the fabulous bamboo green of his vans to his 'we can do that and with minimum environmental impact' attitude, he's just the sort of young, go-ahead pest professional this industry needs.

He already has three of those vibrant vans, as he employs two professional pest technicians, David Parrott and Gary Dunn – the other van is his, as he intends to stay a

hands-on boss. His business is a mix of contract and domestic work.

So let's go back to November 2017 when one of Mark's block management clients called him about a bed bug problem. On investigation this was no ordinary problem. A thorough survey identified 134 flats with bed bugs. The source was traced back to just one flat where it transpired the occupants had been putting up with bed bugs for six years. Why no complaint from them? It seems the couple just thought that this was something they had to live with! And oh boy, were they living with bed bugs!

So many bed bugs!

Mark had never in his 15 years as a pest controller seen so many. He commented:

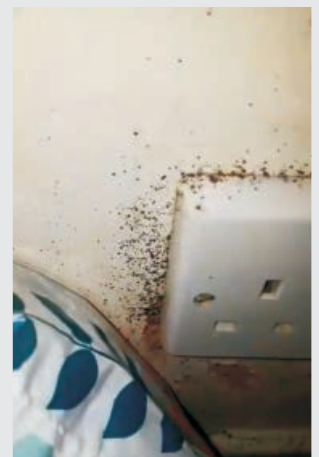
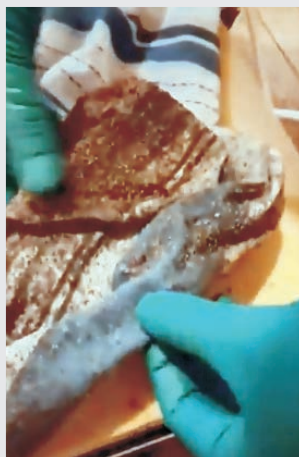
"Never in a million years did I expect to see so many bed bugs. They were everywhere: in the bedroom, the kitchen, the bathroom, the living room... There were so many bed bugs that they were living in cracks in the walls, in the ceiling, under the floor boards, in all the electrical sockets in the creases of the sheets and throw – just anywhere where there was a little harbourage. Some were even living in the open in broad daylight on top of the bed sheets and throw. It really made me pause for thought. How had the occupants been able to live with this for six years?

There were no mental health issues – they had just come to terms with it and what's more by walking through the building daily and visiting other residents in the block

Keeping it in the family

Porter's Pest Control is a family affair. Mark is MD but his wife, Holly, is office manager and no doubt keeps an eye on him. Her assistant is her mum, Dawn Blunt, Mark's mother-in-law – so he's surrounded!

Eldest son Jamie might only be 15 but he's keen to follow in dad's footsteps. He's been out on several occasions and commented that he loved the problem solving aspect of pest management and that going to work with dad has been great for his communication skills.



Bed bugs were everywhere in the sheets, in the bed frame, in the electrical sockets...

they'd been unwittingly spreading the problem."

Mark was clearly going to need some help (this was before he had David and Gary on board) so he called on his mate, Peter Bowers-Davis, from Integrum Services. Pooling their combined knowledge it still took a total of 14 months, including follow up and monitoring visits with detector dogs, to get totally on top of the problem.

The source flat itself had to be completely stripped and refurbished. Even the floorboards had to come up. Mark explained: "There were so many bed bugs that simply spraying insecticide was never going to be enough. Everything, all the couple's possessions, had to be thrown away. We wrapped everything moveable including the mattress and the dismantled bed frame in industrial strength cling film for safe removal from the building."

Fortunately Mark's brother is a waste disposal contractor and he was able to arrange high temperature incineration and provide the fully auditable paper trail.

Once everything that could be 'clinged' had been removed, treatment took a two pronged approach. First a Cimex Eradicator steam generator was used. This is a piece of kit that Mark wouldn't be without on bed bug jobs. He says it played a major part in their success. The steam heated to 180°C kills all stages – adults, nymphs and eggs. After the steam, a residual insecticide treatment was made using what Mark describes as the best product available – Cimetrol Super from PelGar.

Client confidence

"It was great that my client felt able to trust us with such a big job," said Mark. "I prepared a detailed report for him itemising exactly what we planned to do. It meant a lot of weekend work to get access to all the flats and some very long days which meant time away from the family, but the timing made for a healthy Christmas bonus!"



It's a wrap! Peter Bowers-Davis, right, from Integrum Services wields the cling film

Going viral

Mark's decision to live stream the job via Facebook was basically because it was such a major infestation that he wanted to share the experience with other pest professionals. What he hadn't anticipated was the enormous reach of social media and the global interest in bed bugs.

The video was picked up by Unilad and went viral achieving 1.7million views. The story was featured on *The Sun* and *The Mirror* websites and Porter's Pest Control's Facebook page now has 17,000 followers.

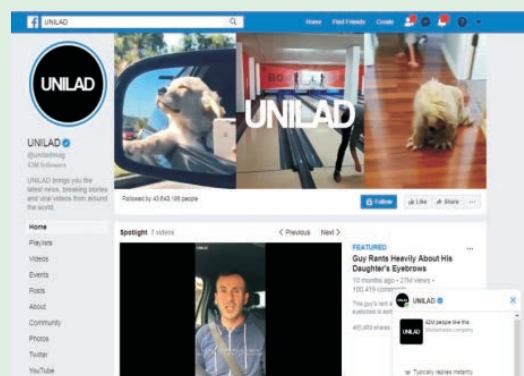
Mark now regularly gets questions from all over the world about bed bugs and indeed other pests. "We've become a sort of 'Agony Aunt' for pest infestations and offer advice where we can, although if it's a bed bug problem we always point out that it needs a professional solution.

It might now be heading towards two years since the footage was first live streamed but the video continues to grab media attention. The latest to feature the job and to interview Mark was *Channel 4's Homes from Hell* broadcast on 1 August 2019.

The video is in two parts

www.facebook.com/608885124/videos/10159573319630125/?t=10

and www.facebook.com/IntegrumPestControl/videos/310365692782913/



The Porter's Pest Control bamboo green fleet, from left Mark Porter, Gary Dunn and David Parrott

Sleeping with the enemy!

If you are lucky enough to receive an invitation to visit Dr Richard Naylor at his base in the very scenic Wye valley do be a bit careful if he offers you overnight accommodation. To support his bed bug testing lab, Richard has set up what must be a unique facility – two identical model hotel bedrooms, one of which he regularly sleeps in, accompanied, in the name of science, by real live bed bugs.

Tucked away down some very scenic lanes near Chepstow you eventually reach Dr Richard Naylor's base. Once there it's out into the garden en route to two timber-built home offices. This is where Cimex Store, the business set up by Richard only seven years ago after completing his PhD at Sheffield University, is based. In this idyllic spot, Richard is taking the world of bed bugs by storm - rearing, testing and preserving this unique insect.

In the UK and, for that matter, in Europe, very few organisations rear and keep live bed bugs. One very obvious reason being that they require a blood meal to reproduce, with fresh human blood being their favoured meal.



Richard with his stock of bed bugs. He estimates to have c50,000 at any one time

Whilst completing his PhD at Sheffield, Richard tended the bed bug cultures kept there for research and frequently received requests from other researchers at chemical companies and consultancies for a supply of live quarry for their own trials. From this he spotted a niche in the market and after leaving the University set up his own business rearing and supplying live bed bugs – Cimex Store Ltd.

From his experimental work at Sheffield, Richard soon realised there was demand for independent trials, namely testing new insecticides and assessing monitors and lures. So the research side was established. With bed bugs being relatively new to the modern pest control industry, many



technicians were not familiar with this insect in all its life stages, so Richard began making resin blocks containing all the life stages for use in training and identification, so completing the third aspect of his business.

So, from this triangle of work sectors, Cimex Store has flourished. To such an extent that he is now very ably supported by his charming wife Alexia, who uses her ex-school mistress skills to keep everything in order, plus the most recent addition, Jan – a part time laboratory technician.

Running alongside Richard's Cimex Store activities is his involvement with the Bed Bug Foundation (see pages 27 to 29), where he is a trustee and member of the Senate. He is also one of our **Pest** Technical Advisory Board members as well as a frequent invited guest speaker at technical events around the world.

Richard runs his business from two purpose-built offices in the garden, the newest of which was only finished at the end of 2018.

The first houses not only the bed bug colonies, a variety of susceptible and resistant strains, but also some of Richard's other 'pets'. Richard has always been keen on natural history, no doubt acquiring it from his parents who both worked alongside



Alexia is a real expert at knowing where to look for bed bugs



Bed bug behaviour is captured using infra red photography



Richard and Alexia Naylor outside the bedroom cabin

Sir David Attenborough on several natural history programmes.

Amongst the 'pets' kept are several types of spiders and scorpions plus a large boa constrictor, which he says he has had since it was tiny.

It is here the bed bug orders are put together for despatch in vials for use by researchers elsewhere, or by those with scent detection dogs for their training and routine maintenance. Amusingly, all orders are despatched via Royal Mail, as live bed bugs cannot be sent via parcel delivery services!

It is also here that the labourious and very time consuming task of preparing bugs in all their life stages goes on, before encasing them in resin to create the training items.

There is also a laboratory where the commissioned trials work is undertaken. A matter of yards away is the real star of the show – the cabin containing an office plus two rooms laid out to replicate identical hotel bedrooms. Why two? As Richard explains, one is used, in effect as a control. Here he can also use an infra-red camera to track the movements of bed bugs at night and to view the effectiveness of traps. Whilst

in the other identical bedroom, he can be found sleeping several nights of the week. Richard is simply trying to mirror the real-life situation of a hotel guest in an infested room. With a warm, breathing human being in the bed, how do bed bugs behave? Or more importantly, how do the products on trial behave?

When conducting a trial, a precise number of bed bugs are released into the bedroom, Richard sleeps in the bed, the activity of the bugs is recorded and then next day any monitors on trial are inspected for catches and the balance are searched out and their



Life cycle resin moulds near completion

positions recorded. This might sound a difficult task, but with experience their favourite resting places are soon identified. After each night, the bedding and the whole room has to be thoroughly cleaned so as to eliminate any pheromone traces which might influence subsequent test bugs.

So, congratulations Richard on creating a totally unique test facility. Sleep tight!



The boa constrictor getting a bit too friendly!



Evaluating one of the trials

**“ Good night, sleep tight
Don't let the bed bugs bite.”**

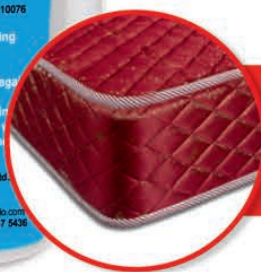


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Out of the dragons' den Nattaro Labs

Chance plays a big part in most of our lives. This was certainly the case for four individuals, none of whom knew each other beforehand, who were thrown together on an entrepreneur's course in Sweden. From this chance encounter rose Nattaro Labs. The company, which fell into pest control totally by accident, is now making its mark worldwide as **Pest** editor, Frances McKim discovered.

In 2010, when four very bright but unemployed individuals signed up to the Entrepreneur programme, run by the Life Science/Mobile Heights Business Center in Lund Sweden, the thought that they would now be running a global business selling bed bug products never crossed their minds.

Between them though, they each had previous experience in a variety of different fields. Of the four, both Carl-Magnus Hansson and Magnus Bäckmark had worked for several years for Sony Ericsson. Christine Dahlman Jacobsen, an economist by training, was previously a key account manager for an IT company. But what was eventually to bring them altogether was biologist Dr Camilla Ryne. She had done her PhD in the Pheromone group at Lund University before transferring to Professor Michael T Siva-Jothy's department at Sheffield University, where her interest in the chemical ecology of bed bugs was ignited.

From her pheromone research, which coincided with the upsurge of bed bug infestations the world over, Camilla could see product development opportunities but lacked the commercial skills to develop her ideas. With her business acumen, Christine was asked to help Camilla prepare a business plan. Called in to help was Magnus with his long experience of product development and Carl-Magnus to use his expertise in industrialisation.

So in April 2011 Nattaro Labs came into being. For those of us who don't speak Swedish, Nattaro literally translated, means 'Good night's sleep'. The founders' vision was to create a company based on innovation, producing products with sustainable design and production.

As is frequently the case with start-up companies, funding is a critical issue. Up until 2012 it was very much FFF-funding, namely Family, Friends and Fools. However Christine, whilst still completing her masters degree in entrepreneurship, put her skills to work and entered a regional business plan competition where Nattaro was selected amongst the ten best. Another success was winning a 'Dragon's Den' type competition at the university – all good publicity – which helped gain attention when pitching for real for funds from potential investors.

Their biggest triumph came in 2016 when Nattaro was selected to the prestigious '33 List', by leading business and technology magazines *Affärsvärlden* and *Ny Teknik*. Not awarded lightly, this is a list of Swedish companies offering an innovative product with 'game changer' international potential. Today funding is a



Above: the original team Christine Dahlman Jacobsen, Magnus Bäckmark, Dr Camilla Ryne and Carl-Magnus Hansson
Right: Dr Jette Knudsen



mix of private and public financing with a growing number of shareholders.

But, just as fate brought this original quartet together, fate dealt them a tragic blow. During the autumn of 2011, Dr Camilla Ryne, the scientific brains behind the developments, fell ill and eventually died of cancer in summer 2012. A whole year elapsed until further funding was secured and Dr Jette Knudsen, a colleague of Camilla's, was recruited. Today Jette is the company's chief scientist.

In 2015 Carl-Johan Gustafson was headhunted and joined Nattaro as its CEO. Today there are a total of eight employed in the company which is located at Medicon Village, situated in the Ideon Science Park in the old university town of Lund in southern Sweden.

If Nattaro and their products appeal to you, they are now looking to recruit someone to strengthen their growing international sales....

Products developed

Discussions with students in university accommodation led to the first product, Nattaro Safe – the bed bug tape. The patented Nattaro Safe is a roll of folded paper with a self-adhesive back. Inside is a thin layer of

diatomaceous earth (DE). As DE is classified as a biocide Nattaro has now got registrations in several European countries but, regrettably, not yet the UK. The second major product, Nattaro Scout, has taken seven years to bring to market. This bed bug detection trap, pictured above with Nattaro's Carl-Johan Gustafson and Christine Dahlman Jacobsen, contains a unique blend of bed bug pheromones simulating a bed bug aggregation. Today it is sold by distributor partners across the globe.





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Heaven scent

Getting great results from scent detection dogs



Set up in 2010 the Bed Bug Foundation (BBF) is a not-for-profit foundation, dedicated to raising awareness of bed bug management through improved communication and education. For the past two years, the Foundation has functioned as a trade association for the small but emerging bed bug scent detection industry in Europe.

Dr Richard Naylor, is one of the members of the BBF Senate, and also the newest member of the Pest Technical Advisory Board, so Frances McKim was delighted to interview him during her recent visit to Richard's facilities (see pages 22 & 23). The latest challenges faced by scent detection dogs were discussed including the recently reported topic of false alerts to carpet beetles. ▶▶▶



Firstly, Richard, what makes bed bug scent detection so challenging?

For the handler, it is as much an art as a science. The handler must understand how scent moves around in a room, the impact of disturbance, air conditioning, open windows etc. While many of our teams have backgrounds in other scent detection disciplines, such as drug and explosives, bed bugs present some unique challenges. The target odour is usually much smaller, which means that the dog must search a room very thoroughly. The handler has to guide the dog around the room, taking care that no potential hiding places are missed. It may be necessary to move a piece of furniture or bed away from the wall to give the dog access to all the hard to reach areas.

It is essential that the handler also has an intimate knowledge of their own dog's specific behaviour. Dogs are dogs, they are not machines. They get tired and have off-days just like people. Dogs can be crafty too. For the dog, finding bed bugs is a game, which results in a reward if they are successful. Some dogs will false-alert in order to get their toy or treat, but an experienced handler will usually recognise this behaviour when it arises.

In training, dogs can also learn to track the odour of the handler who places the hides, rather than search for the target directly. This means that the dog can appear to be performing very well during training exercises but may be much less reliable when on the job. Similarly, dogs become adept at reading the behaviour of their handlers.

Very often when dogs find something that they are not sure about, they look to their handler for affirmation. What the handler believes about the presence or absence of a target scent in that location can influence the outcome of the search, which has been demonstrated in a study by Lit *et al* (2011).

Does the BBF's Bed Bug Scent Detection Dog certification help to root out the cowboys from the industry?

Cowboys aren't the problem. Everybody in this industry is absolutely passionate about working with their dogs. They train with them daily, refining their searching skills, to make them into the ultimate bed bug

detection tools. But this is challenging work. Reading subtle changes in the behaviour of a dog that is constantly working in unfamiliar environments is really difficult and takes years to master.

One of the primary functions of the certification is to identify training issues that the handlers need to work on. Approximately 80% of teams that take our certification fail the first time. This is most often because the dog indicates on a distracter, such as dead bed bugs. But approximately 80% of those that retake their certification pass the second time around, so we can show a tangible benefit, in terms of quality of service, in the work we are doing.

The funny, and sometimes frustrating, thing about dog handlers is that they are often really critical of each other. Larry Hansen, the BBF trustee responsible for the canine side of what we do, says: "The only thing that two dog handlers will agree on is what the third handler is doing it wrong!" I find this often to be true. I guess it mostly stems from business rivalry and it probably occurs



Adult carpet beetle (*Anthrenus verbasci*)

in every industry, but it is a shame because it stops people from sharing ideas and highlighting issues, which allows bad practices to creep in. Nobody knows what they don't know and it is surprisingly easy for mistakes to go undetected.

The BBF has been holding regular training meetings to help address these issues, which has had the positive side-benefit of creating a community in an industry dominated by people who, apart from their dogs, work alone. The benefit of working within a community proved itself this year when carpet beetles were raised as an issue we needed to address.

Carpet beetles? Please explain...

Earlier this year we had several reports from teams and associated industry professionals, that their dogs had hit on carpet beetles (*Anthrenus verbasci*). Some of these teams had passed the BBF certifications within the past 12 months and had proven themselves at finding bed bugs.

First of all, we wanted to know how widespread this problem was, so we sent vials of carpet beetles to our affiliated training schools and asked them to screen as many teams as possible. Almost half of the dogs we screened did indicate on carpet beetles, despite having only ever trained on bed bugs.

Oh no...does that mean bed bugs and carpet beetles smell the same?

No, we don't think so. Well, I'm sure that they are recognisably similar, in as much as they are both insects and therefore share many common constituents, such as a chitin cuticle and a host of fats and proteins that are common to the entire insect group. But insects use pheromones to find each other, and these chemical signals are usually fairly specific to the species, or at least to a



Dogs are not machines. Handlers must have an intimate knowledge of their dogs' behaviour



The BBF holds regular training meetings which has had the added benefit of helping create a community of handlers

group of closely related species. Carpet beetles primarily use (Z)-5 and (E)-5-undecenoic acid, while bed bugs use (E)-2-octanol and (E)-2-hexanol.

But just because the dog is able to tell the difference between a carpet beetle and a bed bug, this doesn't necessarily mean that it knows what to do when it finds one. Presented with something new and recognisably similar to the target scent it is searching for, many dogs will look to their handlers for guidance. The subtleties of what happens in the next few moments can have profound implications for the team's effectiveness from this point forward.

There is a mantra in the scent detection industry; 'Trust Your Dog', and this is why. It is essential that the handler maintains a poker face and lets the dog make up its own mind. The dog may decide to move on, in which case the handler should let it.

But, it is all too easy for the handler to influence the dog's decision. The dog looks at the handler...the handler looks back at the dog...their eyes widen in anticipation of the reward (usually a favourite toy or a tasty treat). If the dog alerts, it will receive its reward. There is never time to confirm the find before rewarding the dog, because this breaks the association between finding something and being rewarded, so the handler has to reward the dog if it makes a positive indication. But if the dog just alerted on something new, then in rewarding it, the handler has just taught the dog a new target scent. Next time it may not even look to its handler for help.

Does it really matter if a dog indicates on something else? Aren't alerts confirmed with a visual inspection anyway?

Ideally, yes, but in reality, this is not always possible. If the dog alerts on a piece of furniture with inaccessible voids and no obvious signs of infestation, then the handler must make a judgement call about whether or not to trust the dog. Some handlers will work alongside a pest controller, who may be able to dismantle the furniture and confirm indications retrospectively. Unless this happens, the handler may never realise that they just added carpet beetles to their repertoire.

Because bed bugs can be so elusive, situations where alerts cannot be verified are relatively common and this doesn't necessarily mean that the dog was wrong. In most cases if the dog alerts, some kind of treatment will be made, even without visual confirmation, "to be on the safe side". It is easy to see how this can result in unnecessary treatments.

So what can be done to fix this problem?

Interestingly, alerting on carpet beetles was much more common for teams that trained primarily on their own. Dogs that trained regularly at training schools generally showed no interest in carpet beetles. This is likely to be because in a school environment, the hides tend not to be placed by the handler, so the dog can't rely on the handler's scent and/or body language to help locate the target. BBF certified teams are now required to visit a training school every three months for a training session and to confirm that their dogs show no interest in carpet beetles.

Training on bed bug pheromone extracts has also proven to be a helpful tool. Using a method modified from Pfeister *et al.* (2008), the bed bug cuticular pheromones can be extracted into a solvent and then evaporated onto strips of filter paper. This makes it possible to train the dog on the very specific component of the bed bug scent picture that distinguishes it from other species.

The presence/absence of cuticular pheromones also helps dogs to recognise the difference between live and dead bed bugs, which is an important skill when dogs are being used to confirm treatment success.



Putting that amazing nose to work!

More about BBF

In December 2016 the BBF published its *European Code of Practice for the use of scent detection dogs* and has become the certifying body for the bed bug scent detection industry in Europe. Currently around 70 scent detection teams from four countries are engaged in an annual recertification process. Successful teams are listed on the BBF website so that pest control companies and members of the public, can find teams working in their area. See www.bedbugfoundation.org/bedbug-dogs/



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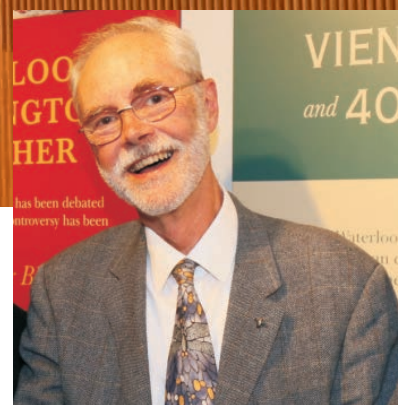
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IPM

Integrated, or is it International, Pest Management?



David Pinniger is invited to the platform by Lisa Nilsen, the main organiser of the 4th International Conference on Integrated Pest Management for Cultural Heritage. Lisa had found an old newspaper cutting from a visit David made to Sweden years ago!



David Pinniger now runs his own consultancy business, DBP Entomology, based in Cookham, Berkshire

Having been involved in pest management for well over 40 years, David Pinniger was delighted to be given the honour of presenting the opening paper at the 4th International Conference on Integrated Pest Management for Cultural Heritage held in May in Stockholm, Sweden earlier this year. It gave him the opportunity to give a personal view of his pest management journey through museums, galleries, libraries, archives and historic houses across the world – how things have changed.

The quagga

My first encounter with pests in museums was the day I received a phone call telling me that a quagga was being eaten by insect pests and lumps of hair were falling out. A visit to Tring Museum (an outstation of the Natural History Museum in London) revealed that the quagga was an extinct type of zebra and the hair on this irreplaceable specimen was being damaged by larvae of *Anthrenus verbasci*, the varied carpet beetle. A survey of the collection showed that there was an extensive infestation in the building of both *A. verbasci* and *Attagenus pellio*. The solution in 1977 was to seal up the building and fumigate the whole museum with methyl bromide gas. Although the treatment was totally successful, the museum wanted to ensure that the collection was not re-infested and I was tasked with providing advice on preventing further problems.

The birth of IPM

The Tring episode occurred when I was working at the Pest Infestation Control Laboratory in Slough which was part of the Ministry of Agriculture, Fisheries and Food. My main area of research was with insect pests in the food storage and processing industries and we had just

started to explore the then new concept of Integrated Pest Management (IPM). Instead of the previous regimes of regular treatment with insecticides and fumigants, we devised programmes using traps to find out where the pests were, targeted cleaning where the pests were living and then treatment only where and when, it was deemed appropriate.

This sounds very familiar now, nearly 50 years later, but was a very new approach for flour mills and food factories. If such a programme could be successful in a food storage environment, then why not in a museum, such as the Natural History Museum?

I then was asked to lecture on IPM for conservation courses at the Institute of Archaeology in London. My first slim volume *Insect Pests in Museums*, published in 1989, was the result of Jim Black (course organiser) persuading me to write a book instead of giving out loose handouts on the courses. Running pest workshops gave me the opportunity to meet and work with people from many countries who were also interested in developing better methods to implement IPM. A participant in one of the first workshops in London in 1987 was Monika Akerlund from the Swedish Natural History Museum. She introduced me to PRE-MAL, probably the first national heritage IPM organisation, with members from Sweden and other Nordic countries.

West Dean and international collaboration

One pivotal point for the international development of IPM was a five-day workshop in 1996 held at West Dean College and organised by the Getty Foundation in California and the UK Museums and Galleries Commission. Key sessions were given by specialists from the Getty Conservation Institute (GCI), The Canadian Conservation Institute (CCI), Spain and the UK.

Participants were from the UK and a number of other countries and many went on to spread the word on IPM in their own institutions. One of the tools to emerge as a result of Amber Xavier-Rowe's participation in the West Dean workshop was the English Heritage pest poster. First produced in 1998, a second revised version was produced in 2008 with input from Dee Lauder. Over

16,000 copies of these posters have now been distributed in the UK and 20 other countries world-wide. We hope to produce a new and updated version of the poster in the near future.

We tend to forget that before 1990 museums worldwide relied heavily on toxic gas fumigation with methyl bromide or ethylene oxide to control insect infestations in collections. Because of concern over health issues, chemical residues and undesirable effects on objects there was then a large-scale switch to the use of freezing in Europe and North America. This was also accompanied by the development of controlled humidity high temperature treatment, nitrogen anoxia and the use of carbon dioxide as a replacement fumigant. For largely economic reasons this trend was not taken up so quickly in many other countries, but the inclusion of methyl bromide in the Montreal Protocol for reduction of ozone-depleting chemicals meant that it would no longer be permitted as a fumigant. A meeting in Japan 'Beyond methyl bromide – meeting the Montreal Protocol' in 2001 was an important turning point and led to more research and development into alternative control methods.

Insect traps and pheromones

Insect behaviour has always fascinated me and led me to thinking about ways to detect insects. In the 1970s I was part of a team carrying out research for better storage of grain and other foodstuffs. We developed effective pitfall traps for bulk grain and then food-baited traps for detecting small numbers of beetles in storage buildings. When I became involved with museum pest problems, it was a natural step to modify these traps for use in museums and other buildings with collections. One of the early international collaborations was with Insects Limited in Indianapolis, USA and over the years we have worked on many projects with traps and pheromones. The most

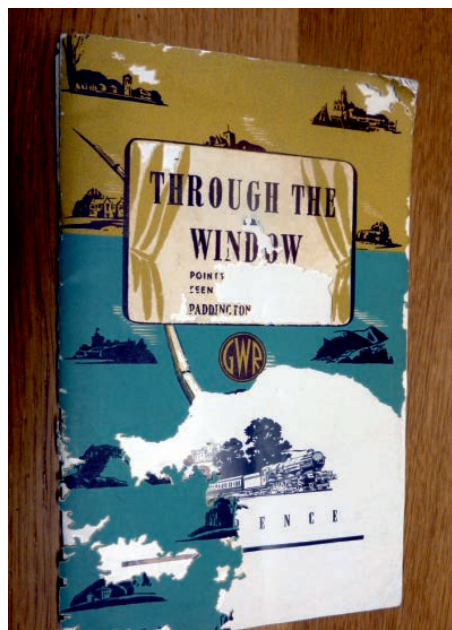
notable was the first UK trial in 1996 of the new sex pheromone lure for webbing clothes moth *Tineola bisselliella*. The performance of this lure exceeded all our expectations with baited traps catching over 20 times more moths than unbaited ones. Since then we have accepted moth pheromones as an invaluable IPM tool for monitoring spread and increase in populations.

Traps are not very effective for most woodboring beetles, but from Germany came the simple idea of pasting tissue over woodborer emergence holes in roof timbers so that you could record fresh adult emergence in the following spring. We have since refined this by using a different colour for each year emergence to build up a pattern of activity of furniture beetles *Anobium punctatum* and death watch beetles *Xestobium rufovillosum*.

A completely new version of my book, now called *Integrated Pest Management in Museums, Galleries and Archives* was published by Archetype in 2001 to coincide with the Pest Odyssey conference held in London.

The conference '2011: A Pest Odyssey, 10 years later' was held at the British Museum in London and showed how many topics had moved forward in the time since the first conference in 2001. There were two notable changes in pest status with the remarkable increase in problems with webbing clothes moth *Tineola bisselliella*, particularly in the UK, but also reflected in other countries. The other was the increasing spread of the brown carpet beetle *Attagenus smirnovi* in the UK and Europe, possibly linked to climate change.

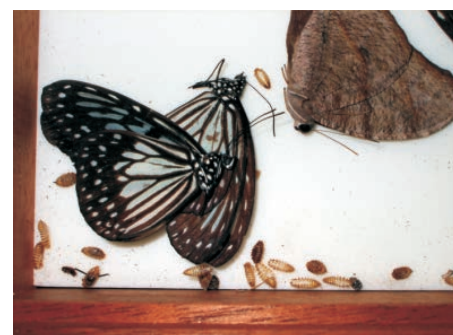
It was agreed at this meeting that the next international conference needed to be held outside the UK and Pascal Querner from Austria took up the challenge and organised an excellent conference in Vienna only two years later. A total of 31 papers were presented from 12 countries, with an even wider participation of delegates from many other countries, showing that heritage



Silverfish (*Lepisma saccharina*) damage to a Great Western Railway book



This green sofa has been damaged by carpet beetle (*Anthrenus verbasci*) larvae



Butterfly specimens damaged by the larvae of carpet beetles (*Anthrenus verbasci*)



Above and right animal fur can all too easily fall victim to voracious pests such as clothes moths and carpet beetles

IPM was on the map across the world. A result of the collaborative work set up in Vienna was that my new archetype book, *Integrated Pest Management for Cultural Heritage*, was translated in to German by Pascal Querner and Bill Landsberger and published in 2016.

Art for art's sake

We are well aware of the potential pest problems of caring for more 'traditional' collections such as costumes, furniture, books, ethnography and natural history. In recent years there has been a huge increase in pest problem challenges posed by art installations which frequently include materials which are not often encountered in museum collections. These include living trees, pasta, dried prawns, dead fish, pigs' heads and piles of rags. Awareness of the risks posed by such exhibitions is essential to avoid serious pest and fungal problems and communication between countries is even more important when such installations move across international boundaries.

Communication and the future

The development of the internet as a tool for communication and sharing data and images has been crucial to promote the low-cost exchange of IPM information between IPM practitioners.

The very useful USA-based website www.museumpests.net was introduced to an international audience in 2011 and the UK website www.whatseatingyourcollection.com (WEYC) in 2013.

It is hoped that the pest distribution database on the WEYC website can be expanded to include data from other countries. It was fitting that a conference poster on the first international collaborative project on pest distribution was with IPM practitioners in Sweden.

The use of communication technology has huge implications which can benefit the future of international IPM in cultural heritage. However, we have seen from the evidence of the past 25 years that there is no substitute for the stimulation and inspiration of meeting fellow IPM enthusiasts. It was very encouraging that so many people were able to participate in this 2019 conference in Stockholm either in person or by live streaming online. By exchange of information between our countries, we can demonstrate that IPM can preserve collections in a cost-effective and sustainable way and secure them for future generations.



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Let's keep it voluntary



Stephen Jacob is CEO of BASIS, the independent standards setting organisation that runs the PROMPT professional pest controllers register. Amid calls from some in the industry that the UK should have stronger regulation determining the qualifications and ongoing training requirements for pest control professionals, Stephen explains, in this article, why he believes that voluntary is best.

One of the benefits of being in my position is the opportunity to meet a wide range of people from all areas of the pest management industry and from across the whole country. This gives a real flavour of attitudes to the latest legislation, trends and – my favourite – continuing professional development (CPD).

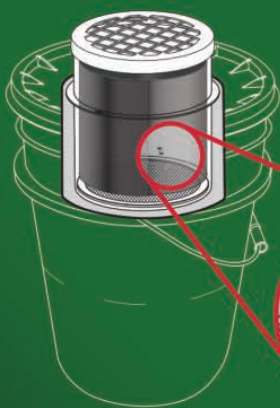
I'm happy to report that gone are the days when I would ask everyone in the room to put their hands up if they engaged with CPD and you'd get just a few hands up in reply. Ask the same question now and you'll get a forest of arms – which is hugely gratifying when you're the CEO of the largest professional register of pest control professionals; all of whom are committed to improving their expertise.

The latest example of this has been at a series of events to meet members of the National Pest Technicians Association (NPTA). Whilst I accept that in these incidences they are a self-selecting audience bearing in mind that the NPTA, which has long been a staunch supporter of BASIS PROMPT, has made being a member of a professional register a condition of joining its organisation.

Their heartening response to my question is, therefore, inevitable, but, if it is reflected elsewhere in the wider industry, then it's hugely welcome, because CPD is key to us keeping our industry in its current state and it's preferable to ensure that it's something that people buy into voluntarily. I say this,

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even though across the Irish Sea, the Republic of Ireland has just made being a member of a CPD scheme a condition of getting a Pest Management Trained Professional User (PMU) number from the Department of Agriculture, Farming and the Marine, without which pest controllers cannot purchase anticoagulant rodenticides.

Happily for BASIS PROMPT, we are the preferred scheme and this has resulted in an increase in members for us, nevertheless, I prefer the *status quo* in the UK, where the Government has taken a more hands-off stance.

Currently in the UK, certificates gained through training are required in order to purchase certain products, but generally the industry promotes the need for CPD itself and BASIS PROMPT works with a range of organisations including pest professionals, training providers and product manufacturers to promote the advantages of ongoing training.

Ongoing training essential

While I am sure that there are rogue operators who don't bother, most people understand that ongoing training is vital but for those who need convincing then the existence of the UK Rodenticide Stewardship Regime is a good reminder of the need for everyone to stay up-to-date with new products, practices and regulation.

A combination of measures set up to ensure that the impact of anticoagulant rodenticides on wildlife is minimised, the Regime is due to be reviewed next year by a HSE-led Government Oversight Group (GOG). This Group will examine the levels of residues of rodenticides in non-target species – namely barn owls.

The last barn owl survey showed some decline in residues and, whilst these were not large enough to be statistically significant, they were an indication that the Stewardship Regime appears to be working. This is excellent news; not least because it is an indicator of how good the industry is proving to be at regulating itself.

We most certainly experienced an increase in membership at the same time as the stewardship regime came in, correlating with the introduction of a requirement that people obtained a training-based certificate of competence in order that they could purchase stewardship-level rodenticides and the recommendation that they participated in continuous professional development.

Currently, this is a recommendation, not a condition, but it is being wholeheartedly supported by the Campaign for Responsible Rodenticide Use (CRRU), which is also monitoring the uptake of CPD materials and will include this when reporting to the GOG.

It does not take a huge leap of imagination to envisage a situation where, if the levels of toxins are found to have increased, then engaging in ongoing training and development becomes a condition, requiring compulsory membership of a CPD scheme.

Once that happens, then there will be no way back and the extra requirement will result in additional red tape for pest controllers, accompanied by more fees to pay and the possibility of compulsory refresher tests, with, doubtless an administration fee on top.

Insecticide restrictions likely

I have no doubt that the stringent controls we see with rodenticides will find their way into the insecticide market too. Only this year we have seen new restrictions on the use of Ficam D, which can no longer be applied outside, nor used on a host of species it used to be authorised for. This was in the wake of concerns about the effect of chemicals on non-target species.

There is a train of thought which suggests that such restrictions will encourage pest professionals to be creative and look more



BASIS PROMPT chief executive officer, Stephen Jacob

holistically at their practice, moving from controlling pests to managing pests including preventing future infestations and seeking non-lethal methods.

There will also be a burden placed upon pest technicians to demonstrate how they can deal with an infestation to consumers who are getting more informed and more concerned about the effects of products on the local ecosystem.

These requirements can only be met properly by staying abreast of developments and investing in your own training by committing voluntarily to a regular programme of CPD rather than only doing so because it is against the law not to.



RoBait
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Can be used with glue board



Bait rods in vertical and horizontal position



Note: Available with clear cover





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Black hawk up

We have noted many times before how inventive people are when faced with a pest problem. This certainly rings true when you hear about the steps taken by Essex arable farmer, John Galloway, to protect his crops from attack by birds. After much trial and error, the Scare'm self launching bird scaring kite was developed.

With all the changes in the General Licensing arrangements, bird scaring kites are increasingly finding their way into urban pest management. Here John Galloway describes how he got Scare'm off the ground.

I've always been interested in flying. In the 1980s I was one of those nutters you saw jumping off cliffs and mountain tops on a hang glider.

Hatching the idea

I didn't know it at the time, but that flying experience and the hang glider shape must have planted a seed in my brain. It was probably why I started to tinker with delta kites and used them to experiment with scaring pigeons off my oilseed rape.

The trouble was, they kept crashing. I remember getting three in the air and

going to have breakfast, only to come back to find them all on the ground: hardly very scary for pigeons. The wind will always drop at some point – that's just a fact of life.

I thought to myself, 'there must be a way of making them self-launching'. And I was determined to make it happen.

The second bit of background that helped spark the whole idea was that we used to use CB equipment around our farm back in the '70s, and we still had a load of equipment lying about – including a five metre aerial. If, I reasoned, I used the aerial



John Galloway holding a Scare'm Hawk kite

and tied the kite to it with a shorter length of cord, it wouldn't crash. I tried it and it sort of worked, ('sort of' because a radio aerial is made of entirely the wrong material), so even if it wasn't quite 'job done', at least it was 'concept cracked'.



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First fledgling steps

The third thing that helped me along was the fact that I'd always loved sailing and I have a modest yacht.

Once, when I took my family on holiday to Holland and we were sailing along the canals there, I noticed the way the fishermen would move their long poles to make way for the boat... and that gave me an idea. When I came back home, I went straight to a fishing supplies shop, and asked the bemused shopkeeper for 40 six-metre roach poles – the sort used to get right to where the fish are swimming. I used these as the basis of my early prototypes.

But even then it was far from 'job done'. There may be relatively few parts in my kites, but each has to be just right and work in harmony with the others to make something that moves authentically, like an airborne raptor.

That's why I took my time in developing them with variations of countless different materials and fittings. It's why I roped in scores of testers, who would each give detailed feedback and suggestions for

improvements. And why I came up with 120 different prototypes before I launched the first Scare'm.

Beware the parrots

Of course, there have been imitators, because on paper it looks like a fairly simple piece of kit. But, unlike the copycats, those 120 prototypes have resulted in a supremely robust scaring machine that's been bench tested to destruction – but that destruction only happens when you ask them to pull a far greater force than would affect our lightweight kites, even in the strongest winds.

And, as for authenticity, it just makes sense to me that it moves and behaves in a way that birds respond to. Our hawk kite mimics the shape and size of a large hawk, and it's in black because that's the silhouette of a hawk as seen from below.

Birds feel very, very uncomfortable about predators overhead. In fact, they're 'programmed' for a flight response. The kite in our Scare'm Hawk Complete hovers at about 12 metres, just like a sparrow hawk, for the maximum scare factor!

Mastering the skies

Our kites have been out for a little while now, and we've been answering the phone to people who want to put them in places we'd never envisaged, so we've developed them to help protect against flying pests everywhere.

They may have started off protecting crops, but today you're just as likely to find a Scare'm hovering over industrial units, solar panels, fish farms, schools, or protecting boats, ships and docks... there's even one patrolling the entrance to the Eurotunnel in Folkestone.

It's funny to think what started as a bit of a hobby has now turned into a successful business. Our kites are now sold direct to customers from our online shop at www.scarem.co.uk or, if advice is needed about which kit to choose, just give us a ring.

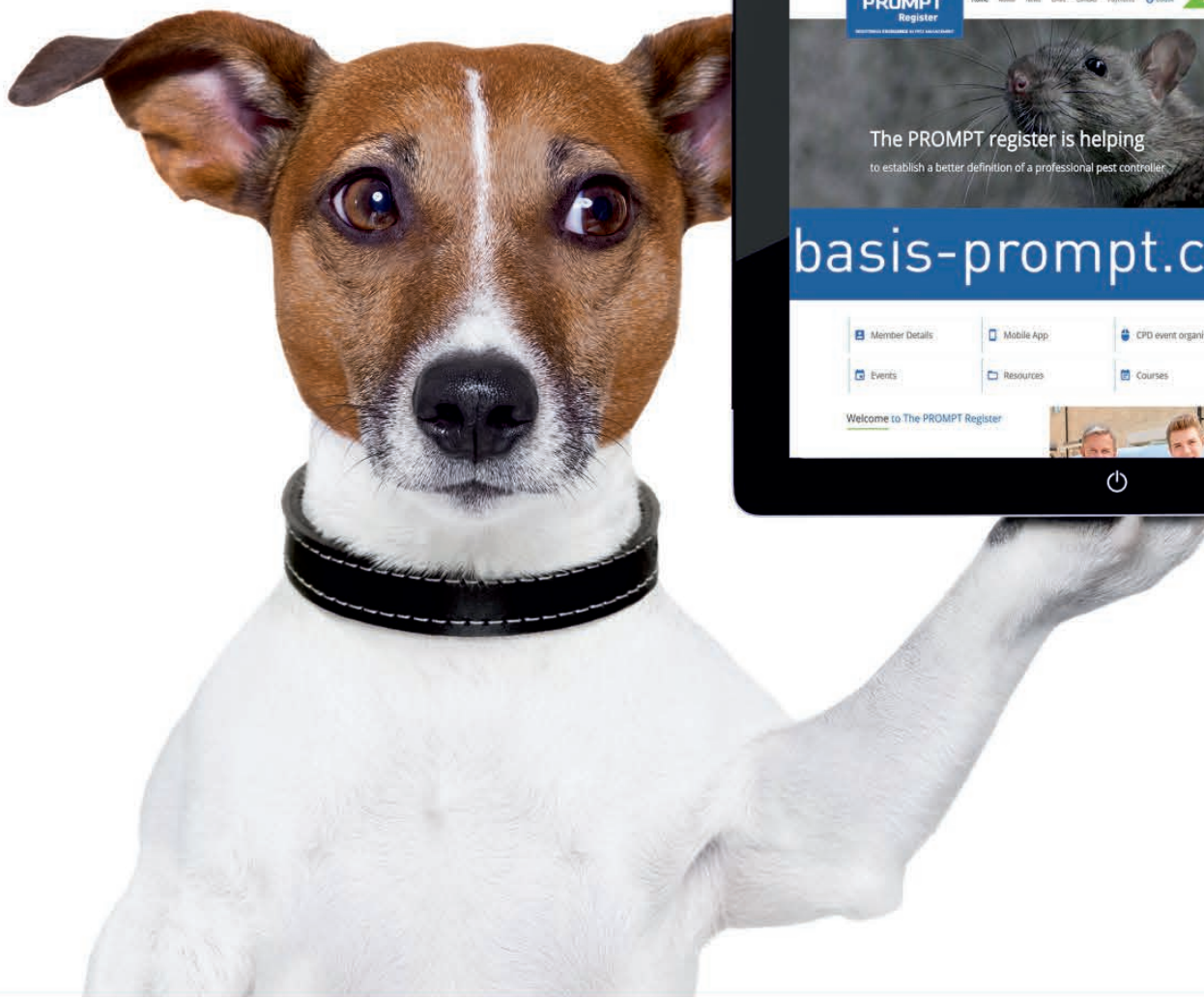


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New app keeps you up-to-date

With smartphones and tablets now an essential tool for busy pest professionals, the new Syngenta Professional Pest Management App provides instant access to essential information to make better decisions on what to treat and how, says Syngenta.

All the information on Syngenta's UK products, including statutory product label and safety data sheets is conveniently held within the app and instantly accessible. The app also provides advice tips and guidelines on best use of products, application rates and a quick

calculator for the amount of product required to treat different levels of pest infestation. Short instructional and practical videos give guidance on what to look out for when assessing pest infestations, along with advice on how to treat in different situations.

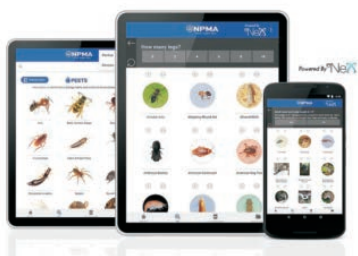
Download your free copy from the Apple Store or Google Play.



New field guide PRO app

The USA's National Pest Management Association (NPMA) also has a new app which, it says, is the most advanced pest management field guide in the world. The guide gives instant access to a library of advanced biology and control methods for over 200 different pests, with high-resolution photos and charts for confident identification and a detailed glossary of terms. It can be customised by adding individual notes and photos and creating a list of favourite pests for quick reference.

Find out more at www.npmapestworld.org or search for 'NPMA Field Guide' in the Apple Store or Google Play. Price: \$8.99pa



Non-toxic options guide

Acheta, the independent pest control auditing and consultancy company, has published an excellent nine-page A4 guide to non-toxic options for monitoring and controlling rodents indoors. Targeted at those responsible for managing pest control contracts, it is also a very useful round-up of the available options for pest professionals. The Acheta team is not adverse to making pithy

comments about the appropriateness of the different options and offers insightful guidance into the frequency of site visits etc. that should accompany them.

The comprehensive list includes all forms of trapping, synthetic and food-based lures, baits for traps, tracking dusts & gels and automatic electronic monitoring systems. Download your copy from the **Pest** library or visit www.acheta.co.uk



Pest Test 64

Also
online

BASIS has made two PROMPT CPD points available if you can demonstrate that you have improved your knowledge, understanding and technical know-how by passing the **Pest Test**. So, read through our articles on *Permanent baiting indoor guidance relaxed* (page 9), *Rodenticide resistance: Will you help fill the gaps?* (pages 10 & 11) and *IPM Integrated, or is it International Pest Management?* (pages 31 to 33) and answer the questions below. Try to answer them all in one sitting and without referring back to the articles.

SEND COMPLETED QUESTIONS to: **Pest** Magazine, Foxhill, Stanford on Soar, Loughborough, Leicestershire LE12 5PZ.

We will mark your **Pest Test** and, if all answers are correct, we will enter the results onto your PROMPT record held by BASIS.

- 1** How frequently should indoor permanent bait points be inspected?

<input type="checkbox"/> a) Every two weeks	<input type="checkbox"/> c) Every six weeks
<input type="checkbox"/> b) Every four weeks	<input type="checkbox"/> d) When a pest professional thinks it's needed
- 2** When can permanent baiting be employed?

<input type="checkbox"/> a) As a last resort when reinvasion is very likely	<input type="checkbox"/> c) Routinely
<input type="checkbox"/> b) If there is even a small risk of reinvasion	<input type="checkbox"/> d) Only when there's an 'r' in the month
- 3** What is the first thing you should do to access free resistance testing?

<input type="checkbox"/> a) Collect three rodent tail samples	<input type="checkbox"/> c) Buy some sealable plastic bags
<input type="checkbox"/> b) Email Clare Jones with your post codes	<input type="checkbox"/> d) Phone the VPU
- 4** What should you do with your rodent tail samples if you are unable to post them to Reading immediately?

<input type="checkbox"/> a) Throw them away	<input type="checkbox"/> c) Put them in the freezer
<input type="checkbox"/> b) Keep them in the van	<input type="checkbox"/> d) Put them in a cool box with freezer packs
- 5** In 1996 David Pinniger was involved in the first UK trial of the sex pheromone for webbing clothes moth. How successful was it?

<input type="checkbox"/> a) Caught the same number of moths	<input type="checkbox"/> c) Caught 20 times the moths
<input type="checkbox"/> b) Caught 10 times the moths	<input type="checkbox"/> d) Caught 30 times the moths
- 6** In 2011 two 'collections' pests were singled out for their remarkable increase – which two?

<input type="checkbox"/> a) Webbing clothes moth & brown carpet beetle	<input type="checkbox"/> c) Brown carpet beetle & furniture beetle
<input type="checkbox"/> b) Webbing clothes moth & silverfish	<input type="checkbox"/> d) Silverfish & furniture beetle

Name: _____

Organisation: _____

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PRODUCTS

What's new?



Colder than ice

Vazor Ice is a ready-to-use freezing spray that eliminates most crawling and flying insects quickly and efficiently. It uses cold temperatures (down to -40°C) to kill the insects making it ideal for situations where insecticides would be unsuitable, or where customers want a 'greener' alternative.

www.killgerm.com

Tray bait!

Ratimor brodifacoum pasta bait is now available in a unique pre-packed 60g tray.



www.killgerm.com

Still time to nominate – just!

Nominations for the **Pest** readers' 2019 Best Product Award close at the end of August so, if you've not yet nominated your favourite, then get your skates on.

We've already had some great nominations. These will be revealed in the next edition of **Pest** magazine when readers will be asked to vote for their favourite.

Which products will join the 2018 winners: Sakarat D Liquid from Killgerm, Rotech Sentry from Tenv and Deadline Fluorescent Tracking Gel?

best
product
award
2019
pest

A flat answer to bait boxes

The latest addition to the range of bait boxes from AldefGlobal is the RoBait Flat. As the name implies, it is a flat, multi-functional bait box that is easily adapted to a pest controller's needs, including wall mounting.



It comes with side opening and a cover security system which, with only one key, means faster servicing. It can accommodate a rat snap trap, glue board, pasta baits, or blocks secured either by vertical or horizontal rods. It is also available with a clear cover.



www.aldefglobal.com

Nasty niff for wasps

Wasp Guard is an organic air freshener formula supplied in an easy to use, portable, and reusable container, making it easy to fix to tables or bars or simply to replace the lid and move it elsewhere.

It works on the principle that essential oils have been used for thousands of years for cosmetic purposes, but are also well known for their distinct aroma and insect repellent properties. Taking these core properties, a unique combination of more powerful oils has been developed. This, claims the manufacturer, produces an air freshener that also delivers an effective barrier against wasps.



www.tenv.co.uk

Going down the drain!

The Killgerm drain smoke bracket is a new, handy bit of kit if you need to get smokes down into deep drains. Killgerm says it has been designed to allow the company's drain smokes to be placed securely into deep drainage chambers. When combined with the company's rat flap pole, the bracket allows drain smokes to be dropped into chambers up to three metres deep. It also acts as a handy fire-retardant base when using drain smokes in plastic pipes. The raised lip at the front and the raised handle at the rear ensure that the drain smoke remains secure when inserting and removing from drains.

www.killgerm.com



Positively charged spray gun

The Victory electrostatic sprayer positively charges any solution sprayed through it providing a 360° coating around any object sprayed. This means the unit applies up to 65% less solution and, say the manufacturers, is over 300 times quicker than a conventional sprayer.

The 3-in-1 nozzle lets you set the spray particle size to match the application. The unit runs on a Victory 16.8v Lithium-Ion battery providing cordless power for effortless movement from room to room. The battery life is sufficient for up to 80 tanks on a single charge.



www.killgerm.com

New formulation offers reduced active ingredient content

K-Othrine Partix from Bayer is a new broad-spectrum insecticide with a unique formulation that provides long-lasting residual control for up to 12 weeks when controlling general insects and up to eight weeks for bed bugs and spiders.

It is formulated with carnauba wax, rather than the man-made solvents used in many insecticides and only contains 2.49% deltamethrin. Due to this new formulation technology, it can be applied at half the a.i. rate of previous products.

The new Partix technology increases the bioavailability of the active substance. Or, put into lay man's terms, it offers excellent performance on all surfaces, even absorbent ones such as wood, stucco and concrete, where traditionally insecticides get 'bound' into the fabric. It comes in a new snazzy 'Nashville' bottle, designed to reduce the use of plastics and other resources.



www.es.bayer.co.uk

Work anywhere eMitter

The latest eMitter products fall under the new DIRECT line, where DIRECT means any eMitter product works everywhere in the UK, both indoors and out. No router, controller or Wifi is needed. It is IP69 protected, meaning dust and water protected, and can be used with a variety of bait boxes including Tenv's Vanguard Station and Project Neo from Pelsis.

It is totally stand-alone and has a rechargeable battery, replaceable in two seconds, that lasts three years and is recharged in around an hour. The product can differentiate between a catch/no catch and sends daily 'I'm alive' signals directly to the eMitter App.



www.futura-germany.com

Fendona 6SC on the way out

Following what BASF describes as 'a procedural irregularity on the part of the reference member state, Greece,' the existing urban pest control uses of Fendona 6SC have not been granted under the Biocidal Product renewal process. Consequently BASF has decided to phase the product out as follows:

12 January 2020: last date for sale & supply;

16 July 2020: last date for storage, use & disposal.

BASF is pursuing activities to extend the use of the product to include urban pest control and says further updates will follow.



Storm Ultra Secure almost here

BASF's new 25ppm (parts per million) rodenticide will be available to pest professionals from November. The new rodenticide, Storm Ultra Secure, which was first talked about at PestEx earlier this year, (See **Pest 62**: April & May 2019 is based on the single feed active flocumafen. Because the amount of active is below the 30ppm threshold set when rodenticides were reclassified as 'toxic to reproduction' it will not need to carry the wording 'May harm the unbornchild'.

BASF says laboratory trials have shown it to be extremely palatable. The company's global technical marketing manager, Sharon Hughes, explained that in the laboratory palatability is measured by the amount of rodenticide consumed divided by the amount of the controlled diet consumed. The standard for most block baits ranges between 0.5 and 1.5.

Storm Ultra Secure recorded palatability in rats as high as 11.3 with even the lowest value recorded being 2.0. These levels of palatability demonstrate that the new 25ppm bait will be very effective at controlling rats and, says BASF, that it will actually be more effective than many 50ppm baits currently on the market.

Pest controllers will have a choice of 3kg and 5kg packs.



www.pestcontrol.basf.co.uk



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- ▶ Full control of resistant rodent populations

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PestWorld heads to San Diego



The San Diego Conference Centre will host the world's biggest pest management event this October when the American National Pest Management Association's (NPMA) PestWorld event travels to the west coast Californian city of San Diego.

Every pest professional should try to make it to a PestWorld at some stage. After all it is the biggest global event in the biggest pest control market in the world. The event attracts thousands of pest management professionals, most from within the USA but there is always a large international contingent.

The exhibition makes PestEx look small with displays of products and, increasingly, services and technologies. The education sessions are so numerous it's often difficult to decide which to attend. Whilst there are some differences between the US and the UK markets, there are also plenty of similarities and so opportunities to learn from each other.

The razmataz of the general sessions is one of the obvious differences. This year's motivational speakers are:

- Richard Montañez who leads multicultural sales and marketing across Pepsi North American divisions and started with the company in 1976 as a janitor;
- Robert Richman, the author of the Culture Blueprint, a systematic guide to building a high-performance workplace.

With direct flights from the UK, it's relatively easy for us Brits to get to California, also a great holiday destination, so two birds could be dealt with at the same time! But, don't worry if you can't make it our editor has already booked her ticket so **Pest** will be there to report on the highlights.



If your interest lies in fumigants and pheromones then here's the perfect excuse to travel to Victoria Falls, Zimbabwe next May when USA-based Insects Limited, and sister company Fumigation Service & Supply, will be hosting the 14th Fumigants & Pheromones Conference. The event will be held at the Elephant Hills Resort between 12 and 14 May 2020.

This biennial event has travelled to many countries since the first conference in Lubeck Germany in 1993, but it is the first time it has been to Africa.

Sharing through education has been the underlying theme for all these conferences which focus on protecting stored products. Speakers for next year's Victoria Falls gathering will, again, be some of the premier specialists in the world. For more information and conference registration visit www.insectslimited.com

Diary dates

9-13 September 2019

12th European Vertebrate Pest Management Conference

VetAgro Sup, Campus Agronomique of Clermont-Ferrand, 89, avenue de l'Europe - BP 35, 63370 Lempdes
<https://evpmc2019.sciencesconf.org/>

24-27 September 2019

FAOPMA - Pest Summit 2019

Daejeon Convention Center, Daejeon, Korea
<http://www.faopma2019korea.org/>

15-18 October 2019

PestWorld 2019

San Diego Convention Center, Manchester Grand Hyatt Hotel, San Diego, California <http://pestworld2019.org/>

6 November 2019

PestTech 2019

Arena MK, Stadium Way, Bletchley, Milton Keynes MK1 1ST <http://www.npta.org.uk/pesttech/>

14 November 2019

SOFHT Annual Lunch, Lecture & Awards

The Brewery, 52 Chiswell Street, London EC1Y 4SD
<http://www.sofht.co.uk/>

20-21 February 2020

Expocida Iberia 2020

IFEMA - Feria de Madrid Av. Partenón, N° 5, 28042 Madrid, Spain <https://www.expocida.com/es/>

11 March 2020

PPC Live 2020

Yorkshire Event Centre, Great Yorkshire Showground, Harrogate HG2 8NZ <https://bpca.org.uk/Upcoming-Events/ppc-live-2020-professional-pest-controllers-live/>

18-19 March 2020

Pest-Protect 2020

Arena Berlin, Eichenstraße 4, 12435 Berlin, Germany
<https://www.pest-protect.eu/en/trade-fair-symposium.html>

Collecting PROMPT CPD?

If you're collecting Continuing Professional Development (CPD) points as a member of BASIS PROMPT then the number you need to claim the two points available for reading **Pest** magazine throughout 2019 is: PC/79634/19/g

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