



Monitoring provides early warnings of infestation

Remote monitoring for rodents: Are we repeating the mistakes of the past?

Dr John Simmons, Acheta business unit director for Kiwa UK, and Pest Technical Advisory Board member, says that monitoring is an essential part of any pest management programme



Done properly, monitoring provides early warning of the appearance of infestation, or escalation of existing infestation. It allows the progress and success of any control programme to be evaluated.

However, if the same product or technique is used to both monitor and control you may be storing up trouble. Should something hinder or prevent control then monitoring will also likely be compromised. The result may be that you know you have a problem, but have only limited means of assessing the extent.

We have traditionally linked rodent monitoring to control, trying to achieve both at the same time using the same devices. Rodenticide baits or physical traps are meant to monitor for presence while also killing the animal. Should the rodent find a way to overcome or avoid the control then monitoring will be compromised too.

We know that genetic resistance to rodenticides is a problem. So too is the avoidance of bait and trapping stations. Such behavioural resistance may well have a genetic component. Rodents are intelligent, certainly when compared



EDIALUX PROFESSIONAL'S BAITING SOLUTION

The Neo rodent bait station from Edialux Professional is a commercial bait station. It lacks a 'floor' in the entrance tunnel area, making it a very different prospect for a foraging rodent. The 'barrier to entry' will probably be significantly lower than within a conventional rodent bait station.

Although it lacks a specific mounting point for the GTO detector, it does provide a more protected environment if you are looking to monitor remotely in locations where protecting the detector from environmental conditions such as wet and dust is important.

We have trialled this approach and found it to be very successful, though it would obviously be better to be able to mount the detector above the entry tunnel rather than in the way shown in the photo.

to an insect, so linking monitoring and control is a dangerous approach. If they decide to avoid the monitoring-control device then how do we assess the extent of the problem, let alone control it?

Having applied selection pressure using baits and traps intensively for many decades, I have no doubt that there are some situations where we are now reaping the reward; an inability to successfully monitor the population, and a concomitant inability to control them.

Remote monitoring technology will never replace the need for detailed, expert, inspection, but it does offer us a unique opportunity to separate monitoring from control. By and large, this is an opportunity we are wasting.

There are a multitude of these systems on the market, but most are designed around so-called intelligent traps. These traps are undoubtedly clever, using IoT technology that communicates when the trap has been activated, either accidentally or through an actual capture. However, if the rodent avoids the device, then an intelligent trap is a stupid trap.

To highlight the nature of this problem I want to revisit an article that I wrote for *Pest* back in 2015 (Pest 39). This summarised the results of a trial that we had undertaken in Acheta, at our own expense.

Using the GreenTrapOnline (GTO) remote monitoring system, the aim was to investigate and

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quantify the effectiveness of conventional baits and traps as monitors of house mouse activity. This trial was undertaken inside a large retail distribution centre with a long-established house mouse infestation.

For the trial we selected 25 locations in the warehouse, ranging from places with no evidence for mice through to those where evidence was obvious. At each location we placed four monitoring devices:

- ◆ A plastic bait station containing non-toxic paste bait;
- ◆ A cardboard bait station containing non-toxic paste bait;
- ◆ A plastic trapping station containing a break-back trap baited with the rodent attractant Provoke; and
- ◆ A GTO detector, which was positioned on top of upturned guttering, and had both non-toxic paste bait and UV tracking dust underneath.

These four monitors are shown below left. It is important to highlight that we chose upturned guttering as a carrier for the GTO detector precisely because it was NOT a bait station. We figured that it would present a negligible 'barrier to entry' for a mouse seeking cover. The GTO detector contains a PIR sensor that is triggered by the heat and movement of a moving rodent. The trial ran for two weeks.

Activations ranged from just one in the fortnight through to 105, and nine of the 25 GTO detectors recorded activity. At every one of the nine locations we found evidence of mice moving through tracking dust, so could safely conclude that the system was not recording false positives.

Equally importantly, no rodent movement was observed through tracking dust at the 16 locations where no activations were recorded, so false negatives weren't an issue either. We concluded that GTO was providing robust and reliable information concerning the distribution of mice, a conclusion supported by the time of day data for

activations, which clearly showed the expected circadian rhythm of mice.

Rodent activity recorded by the baits and traps was, to say the least, disappointing:

- ◆ Of the non-toxic bait under the GTO guttering, we had one full and one part take;
- ◆ In the plastic bait stations, we had no takes and tracking dust suggested that they had only entered one station;
- ◆ In the cardboard bait stations, we had one part take and evidence for mouse entry within only this one box;
- ◆ The trapping boxes caught nothing, and tracking was observed only within a box where the trap had been accidentally activated!

These results highlighted two main concerns:

- ◆ Mice were ignoring the paste bait even when it was presented in a non-bait station setting, in locations where we knew they must have encountered it.
- ◆ Tracking dust evidence (below right) showed deliberate bait station avoidance.

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SHOULD WE BE SURPRISED?

Professor Gai Murphy conducted much research into house mice when at the University of Salford. Commenting on results of one of her team's investigations into mice in residential properties she stated that: "Mice are reported to be inquisitive feeders, appear to feed randomly and have no marked neophobic response in relation to food sources. Results from our trial suggest that this is not always the case."

Similarly, across the pond, New York-based rodentologist Bobby Corrigan has this to say:

"Not all mice in a colony are 'curious'. Some mice are like rats, they may avoid new objects such as traps and bait boxes completely. All control programmes should account for curious and non-curious mice".

Returning to remote monitoring, if we base the monitoring programme solely around baits and traps then can we really be sure that it is providing an accurate picture of rodent activity?

This approach will certainly work on many sites, but I am equally certain that it will not work on every site, particularly those that have deep-seated infestation within a structurally complex building. If there are sites where remote monitoring is not identifying active infestation then are we really making best use of it?

WHAT'S THE ALTERNATIVE?

I suggest that we should be looking to 'decouple' monitoring from control. We have spent the past 50 years educating our customers that we can control rodents with the same devices we are using to monitor for their presence. We now need to educate them that this may no longer (if it ever was) be the best approach.

Remote monitoring programmes should ideally be built around technology that relies only on a rodent moving around in order to be detected.

I can hear the gasps of horror. However, this approach is no different to how we deal with insect pests. Cockroaches, bed bugs, stored product insects, mosquitoes and house flies are monitored with specific devices, which play little or no role in actually controlling them.

As a result, if a particular control technique doesn't work then not only will monitoring not be impacted but continued effective monitoring will tell you that you have a control problem, and allow you to try an alternative approach which, again, monitoring will allow you to evaluate.

Am I suggesting that baits and traps should be removed as permanent monitors and replaced by motion-detectors alone?



The four monitoring devices



Tracking dust evidence for bait box avoidance

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▷ I would like to say yes, but this is (probably) unrealistic given our customers' expectations. Integrating remote monitoring technology with conventional monitoring is a more realistic approach for now, though I suspect that once it is appreciated how good these systems are, both the pest manager and customer would soon feel confidence in placing greater reliance on them. 'One-for-one' replacement of baits and traps by remote detectors is impractical, not least

because of cost. Instead, this approach should encourage you to think like you always should have been doing; like a rodent!

The monitoring should focus on areas attractive to them; storage, waste handling areas, plant rooms etc, not reception areas, corridors, offices, wet areas, and either side of every door. Remote monitors open the door to monitoring locations where rodent movement is likely, but where access and safety restrictions can make

conventional monitoring a challenge; false ceilings, high level ledges, roof voids and wall cavities, for example.

It is very early days for what is undoubtedly the most exciting development in rodent monitoring that I have encountered in my 30+ years in the industry.

However, by focusing on trap-based technology the industry risks negating the single biggest advantage that this technology provides; a monitoring programme that requires only that a

rodent move in order for the alert to be raised.

(RODENT) LIFE DURING LOCKDOWN

Shortly before the first lockdown, we installed the GTO system into a retail mall comprising a mix of food and non-food retail premises, restaurants and cafes.

In Pest 70 (August/September), the results of our monitoring of the mouse population in this complex was published. The site did not re-open after the first lockdown and we now have a year's worth of data for a site that has gone from busy to closed. The graph shows the pattern of detections during that time.

What can we learn from this?

Certainly, not every site has experienced the so-called upsurge in rodent activity that has received so much media focus. More importantly, remote monitoring has conclusively demonstrated the complete collapse of a well-established rodent population.

Even supported by detailed inspection, could we have reached the same conclusion if baits and traps alone had been used?

Proving absence is THE most difficult thing in pest control, and remote monitoring truly does allow this. 📍

DETECTIONS RECORDED DURING COVID-19 LOCKDOWN

Activations per month



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