

2011



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Bed Bugs Limited

Prepared by

David Cain

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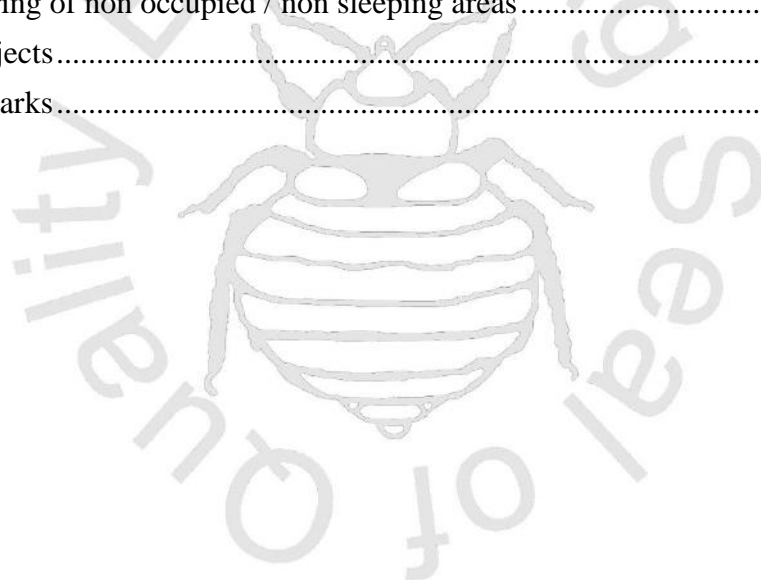
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PASSIVE MONITOR FIELD UPDATE REPORT FEB 2011

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Background

Passive monitors are designed to illustrate the first detectable signs of a bedbug infestation namely:

- Live samples
- Cast skins
- Faecal traces

Field trials have indicated detection of single ingressing bedbugs as quickly as 12 – 72 hours from infestation event using in-house staff.

We have continued to collect field data for a variety of settings and scenarios to illustrate the long term performance of the system in field conditions and to explore new applications and treatment methodologies.

This document provides an overview of how we have been using the passive monitoring technology and illustrates some of the results including summaries of specific case studies.

In continuing to develop the applications for the passive technology we have kept the following aims in mind:

- Early detection results in lighter infestations
- Lighter infestations are easier to eradicate
- Lighter infestations have lower impact on operational efficiencies, adverse PR and the risk of spreading
- The lightest infestation can be dealt with before guests complain or raise concerns

Applications

The most widely used applications for passive monitors are listed below:

- Monitoring for ingress as the focus of an integrated inspection process
- Treatment via passive monitor replacement as a non chemical strategy
- Treatment with passive monitors as an adjunct to the treatment process
- Post treatment monitoring
- Monitoring of non occupied / non sleeping areas

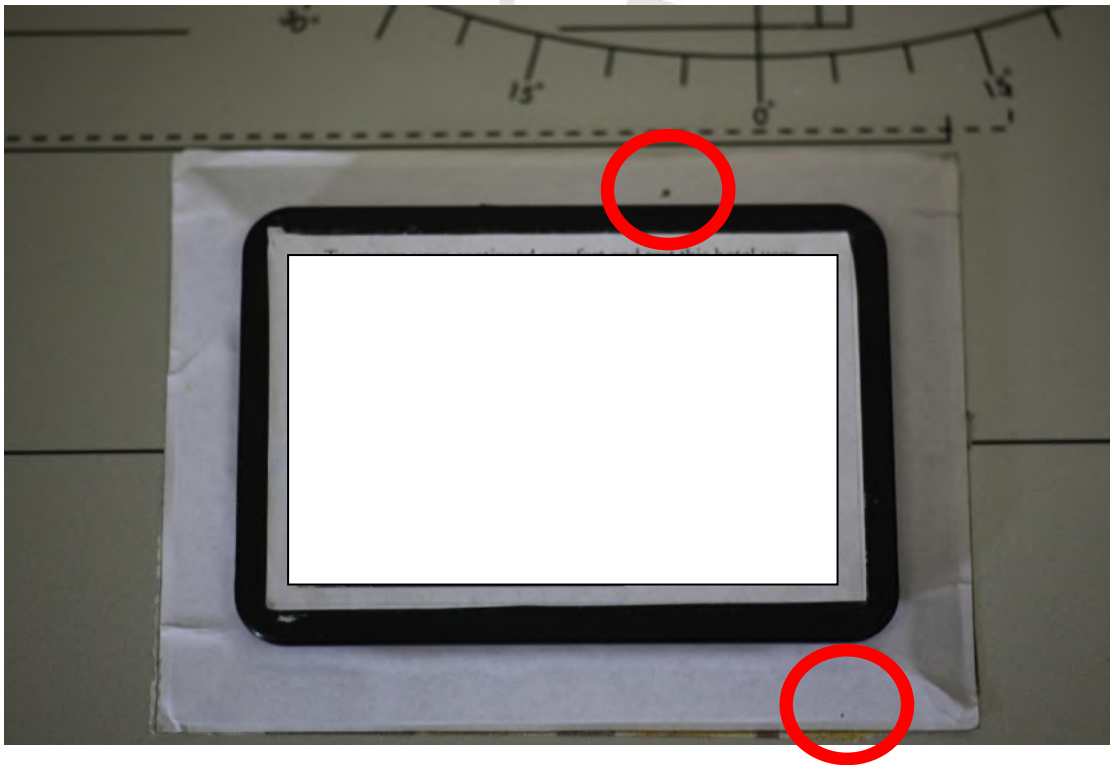
The results illustrated below have been collected from a variety of environments such as:

- Social housing hostel in central London 200 rooms – originally 68% infected
- Social housing hostel east of London 240 rooms – originally 15% infected

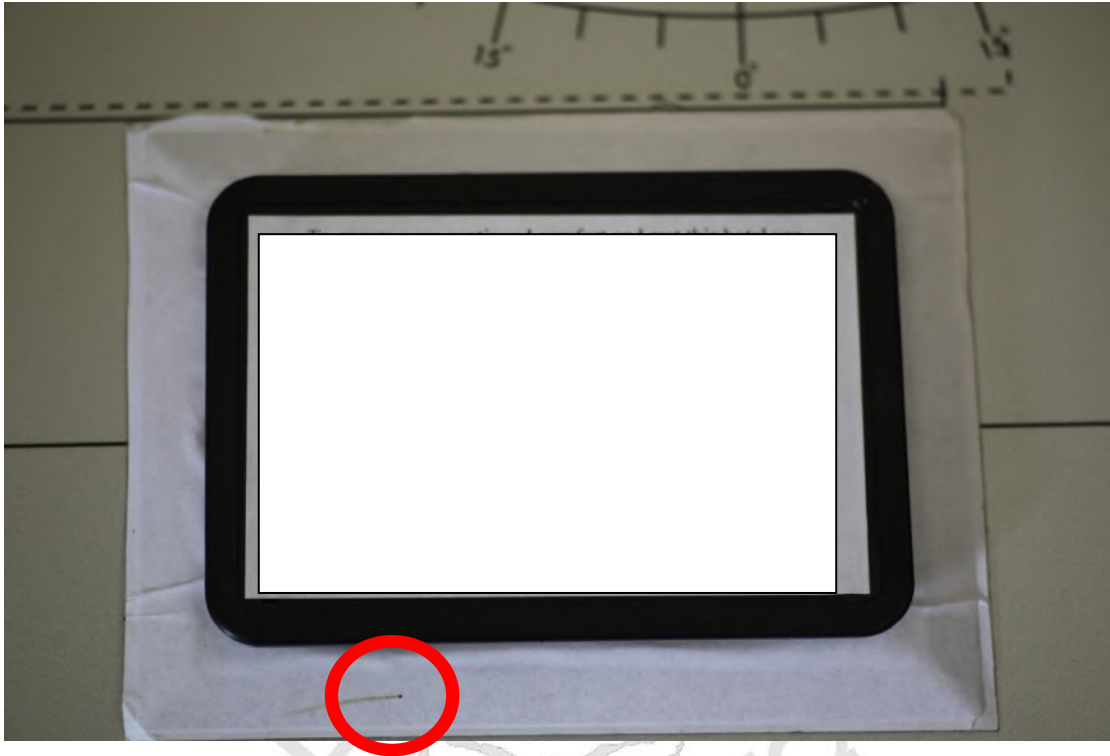
- Small family run hotel in central London 38 rooms – originally 5 infected rooms
- Small family run hotel in west London 28 rooms – persistent low level infestations
- Variety of private properties including single family homes and houses of multiple occupation as well as higher density buildings.

Data

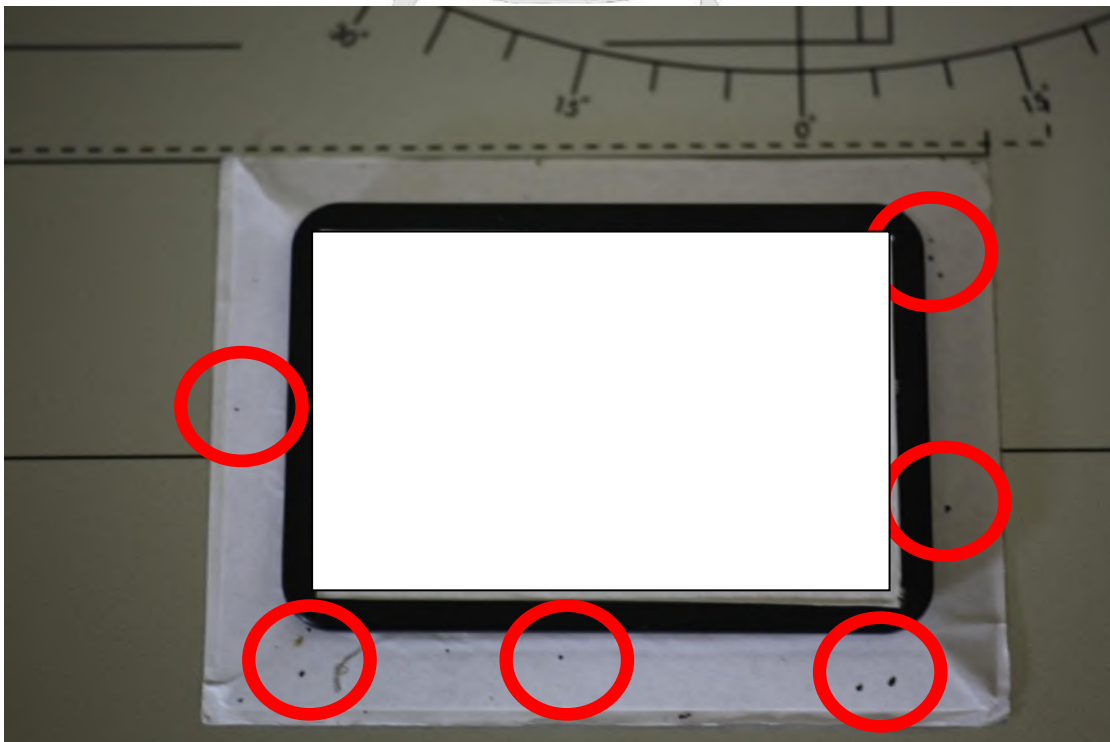
Monitoring for ingress as the focus of an integrated inspection process



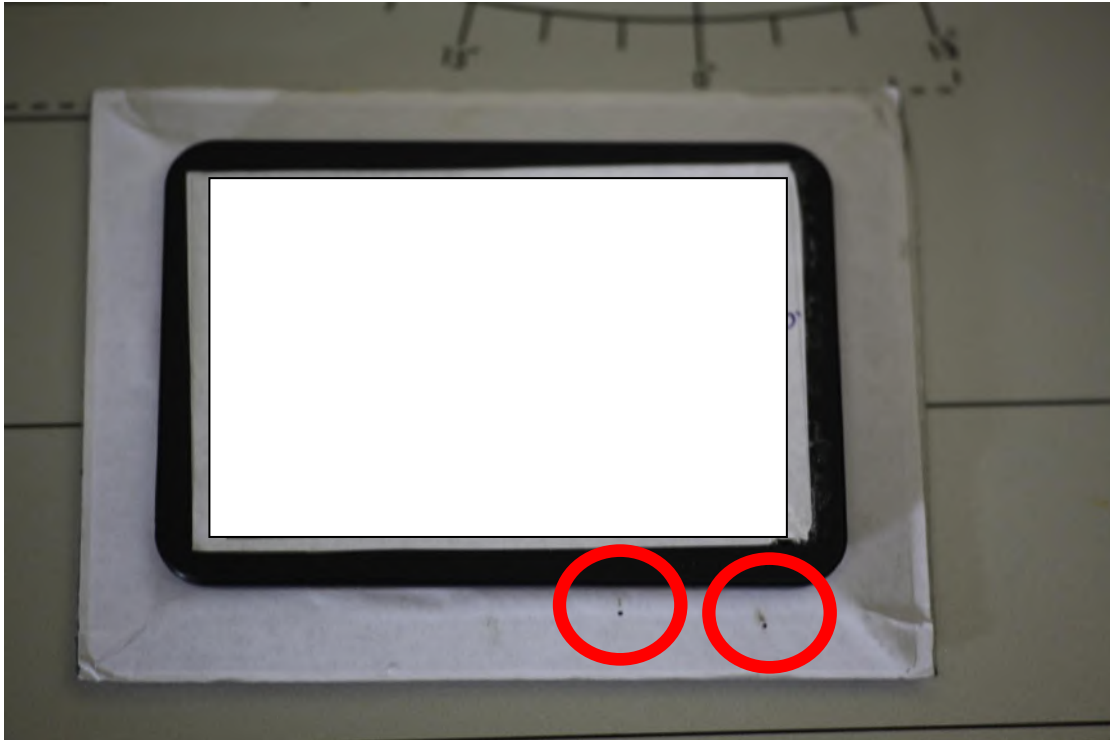
Light infestation identified within a few days of the infestation event occurring, the guest was not even aware of the issue.



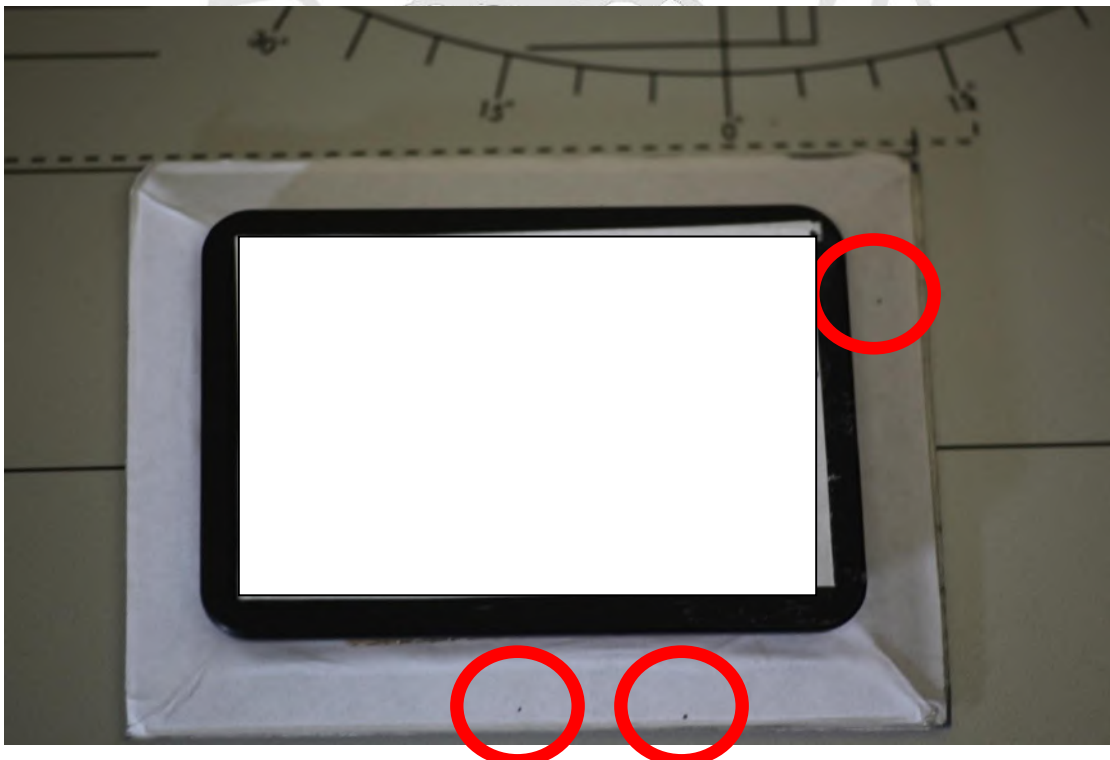
Light infestation identified within a few days of infestation event occurring in a central London hostel. When examined the monitor contained a single adult female bedbugs which had laid 5 eggs. The eggs were identified before hatching.



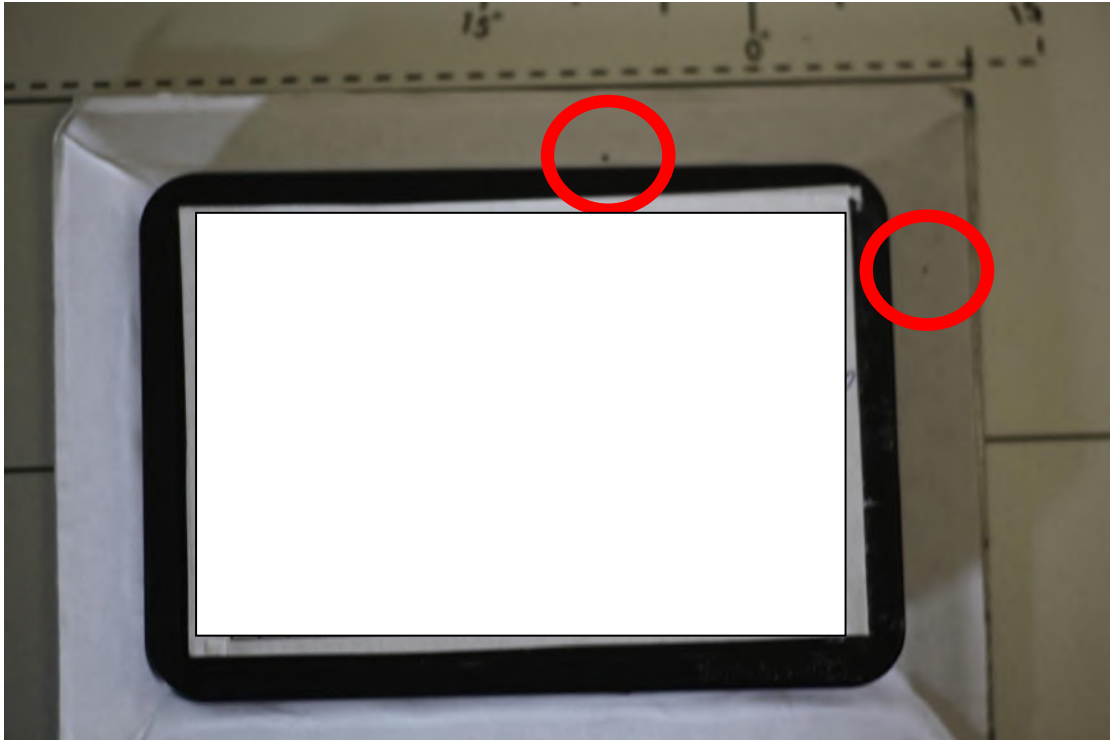
An infestation quickly identified despite a large number of samples having been brought into the room by the previous occupant. Current guest had one or two bites.



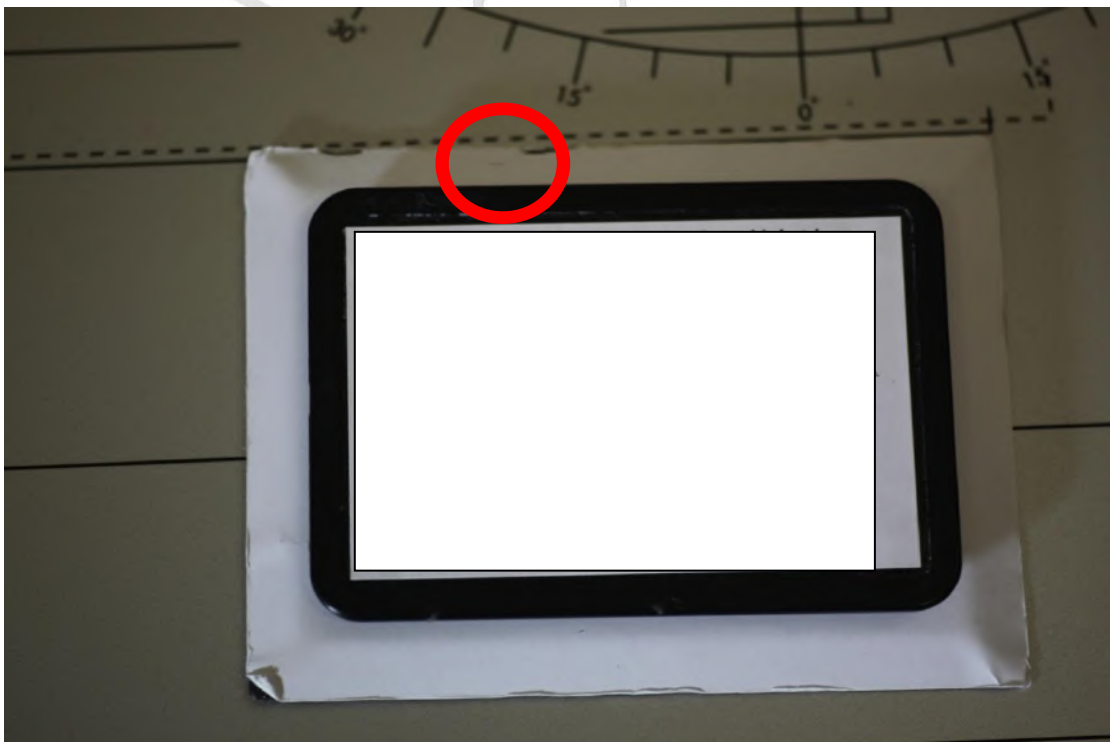
Light infestation identified shortly after the infestation event occurred.



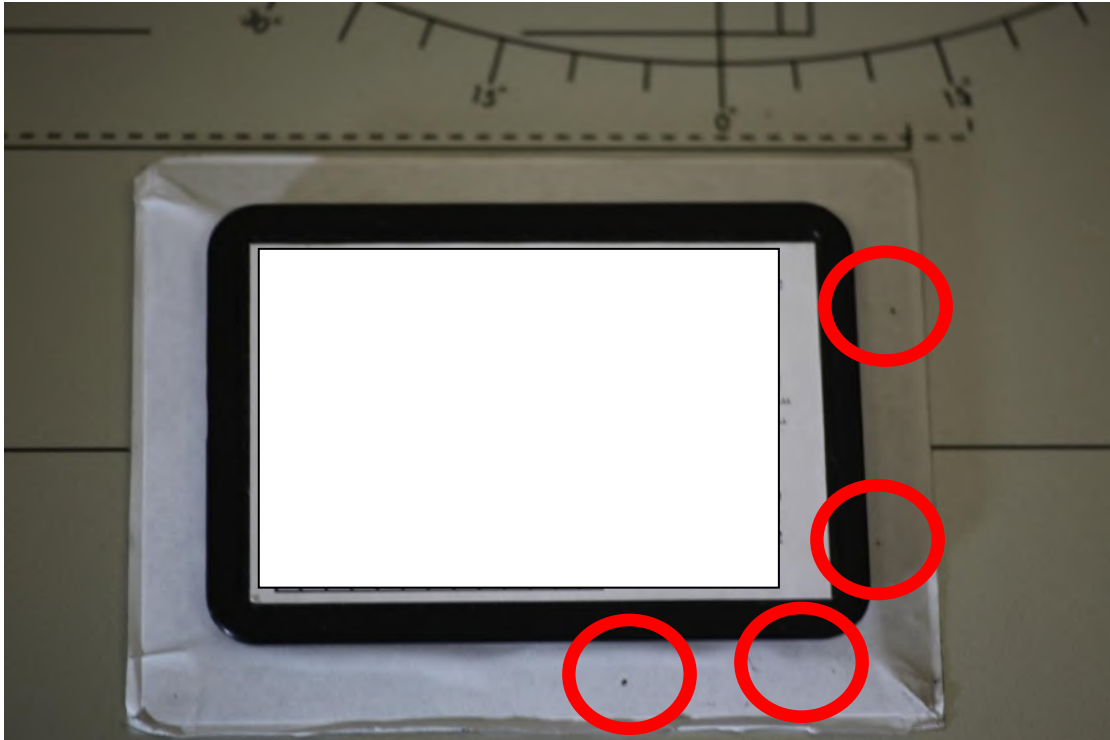
Monitor removed from the second bed in the room confirming the infestation.



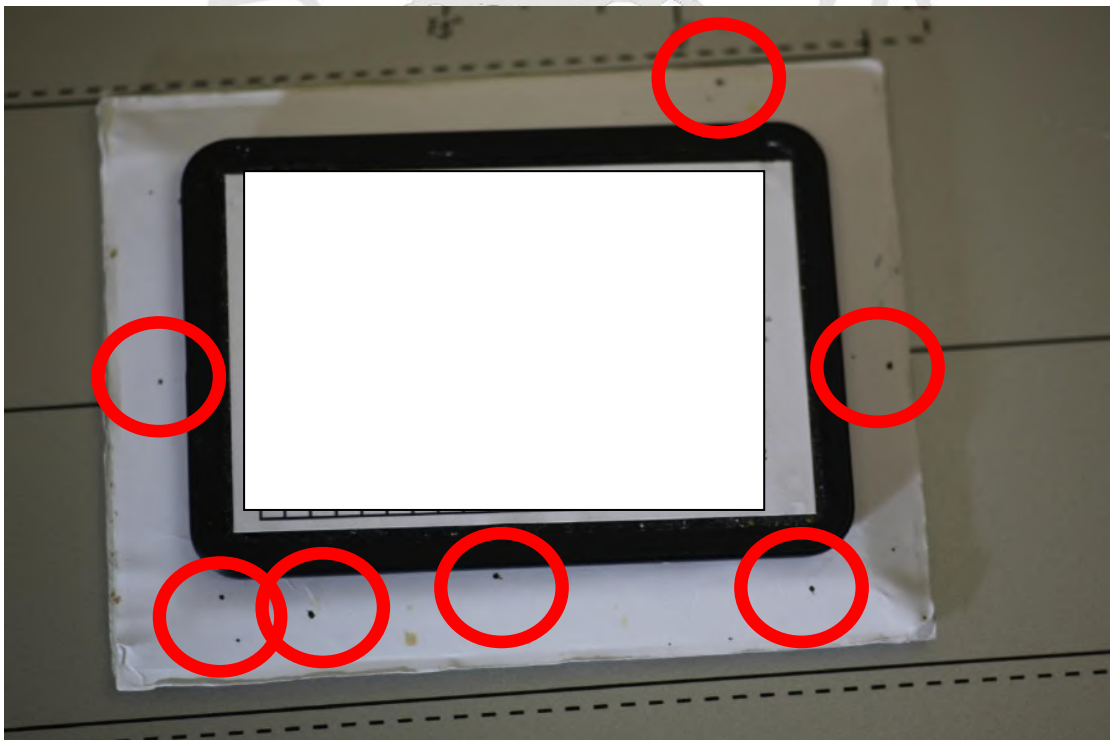
Monitor removed from the third bed in the room showing signs of activity.



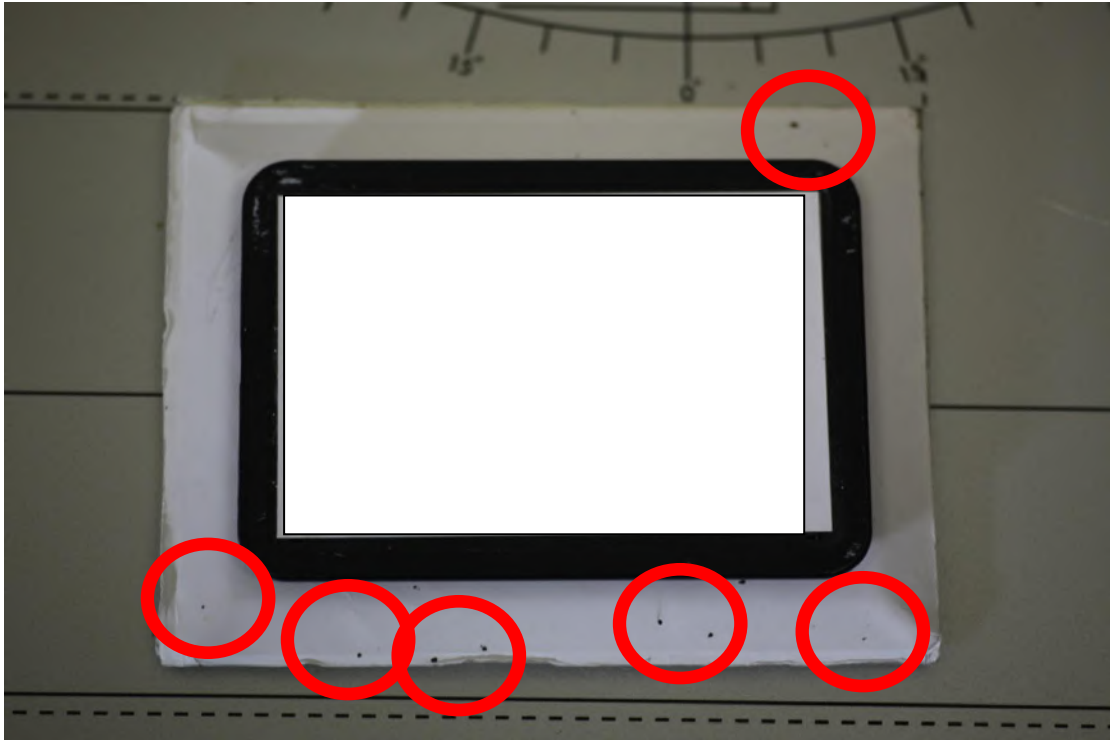
Monitor detecting single bedbug ingress.



Bedbug incidents often appeared to come in waves in some establishments, possibly in connection with tour parties and previous locations.



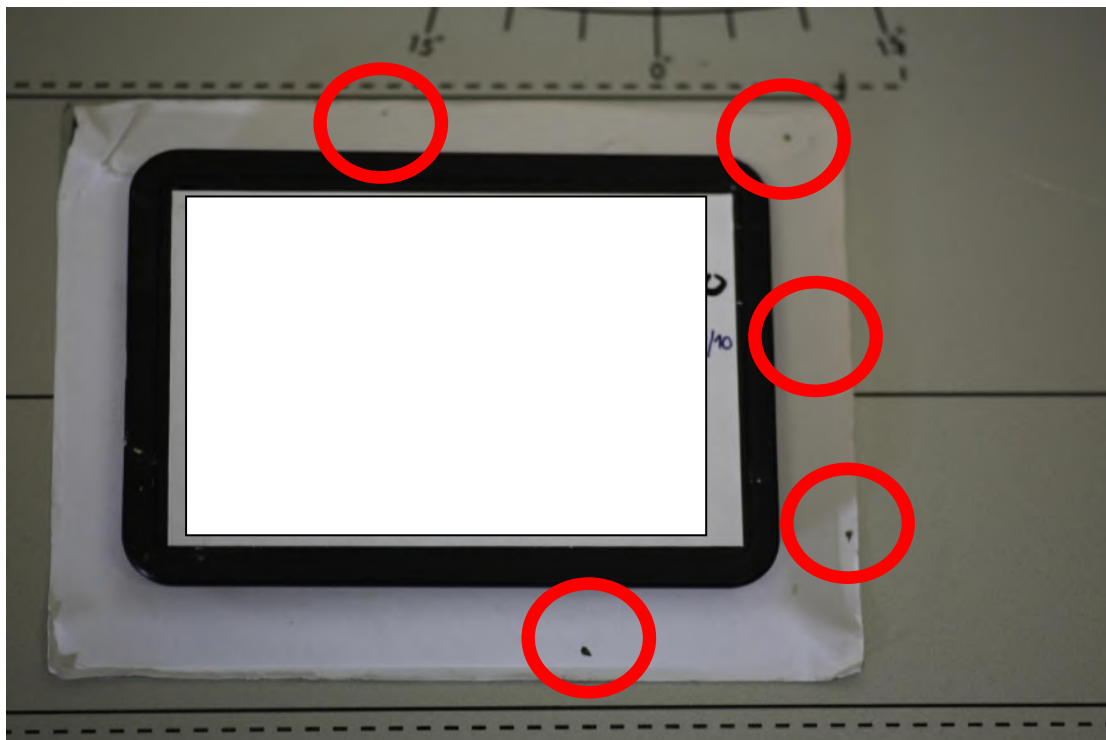
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In one of the hostels incidences increased in the summer as the guest profile shifted



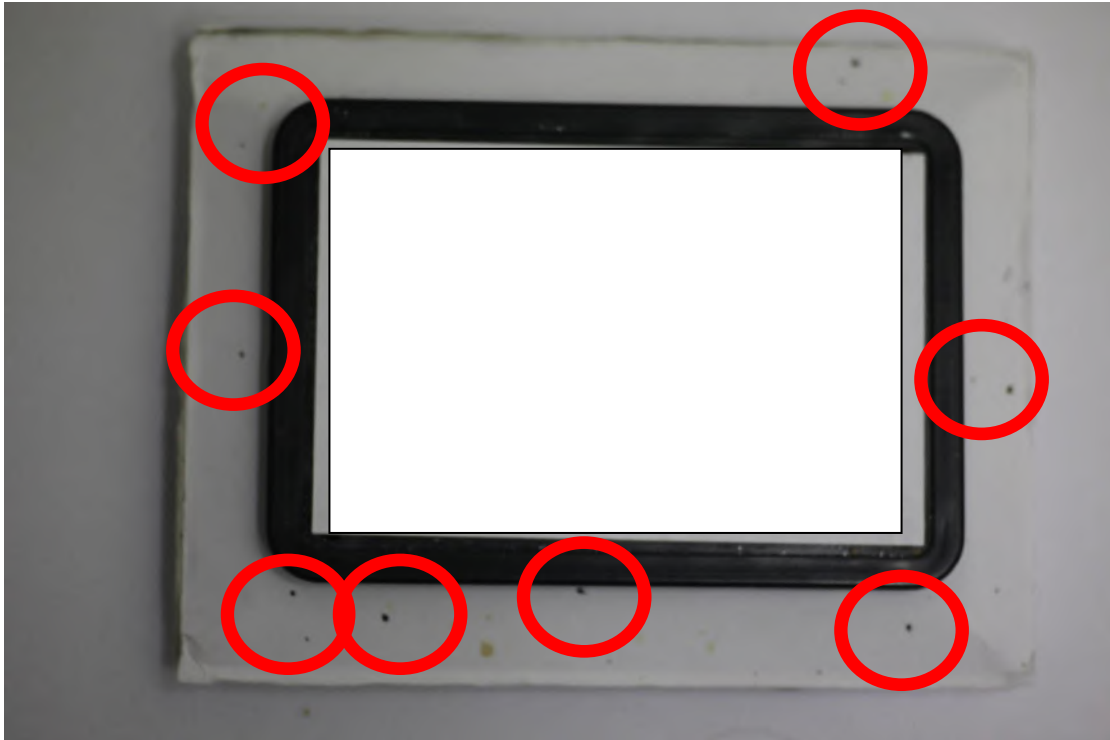
Another early detection of a single bedbug.



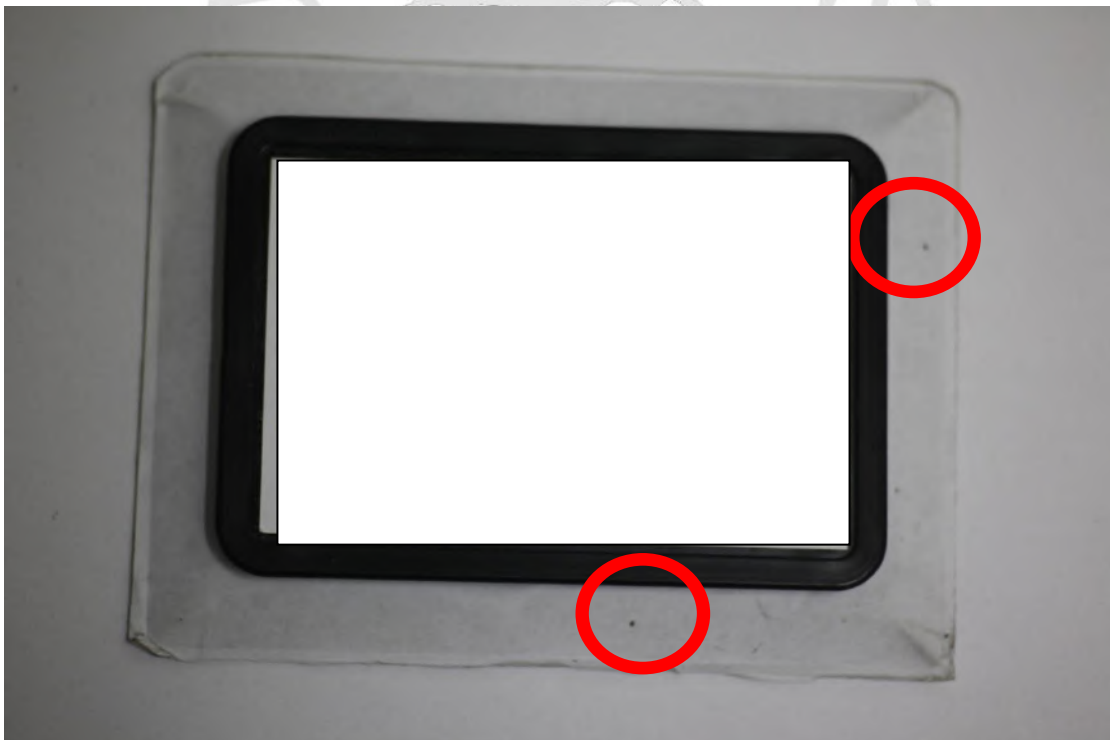
The more experienced the house keeping staff and the more integrated into routine the procedures become the earlier the detection results.



Identifying infestations before the first wave of eggs has hatched enables the fastest eradication times.



Once bedbugs start to colonise the passive the aggregation effect of faecal traces ensures that others soon relocate into them.



One of the early realisations of the full install system was just how frequently rooms actually get infected.



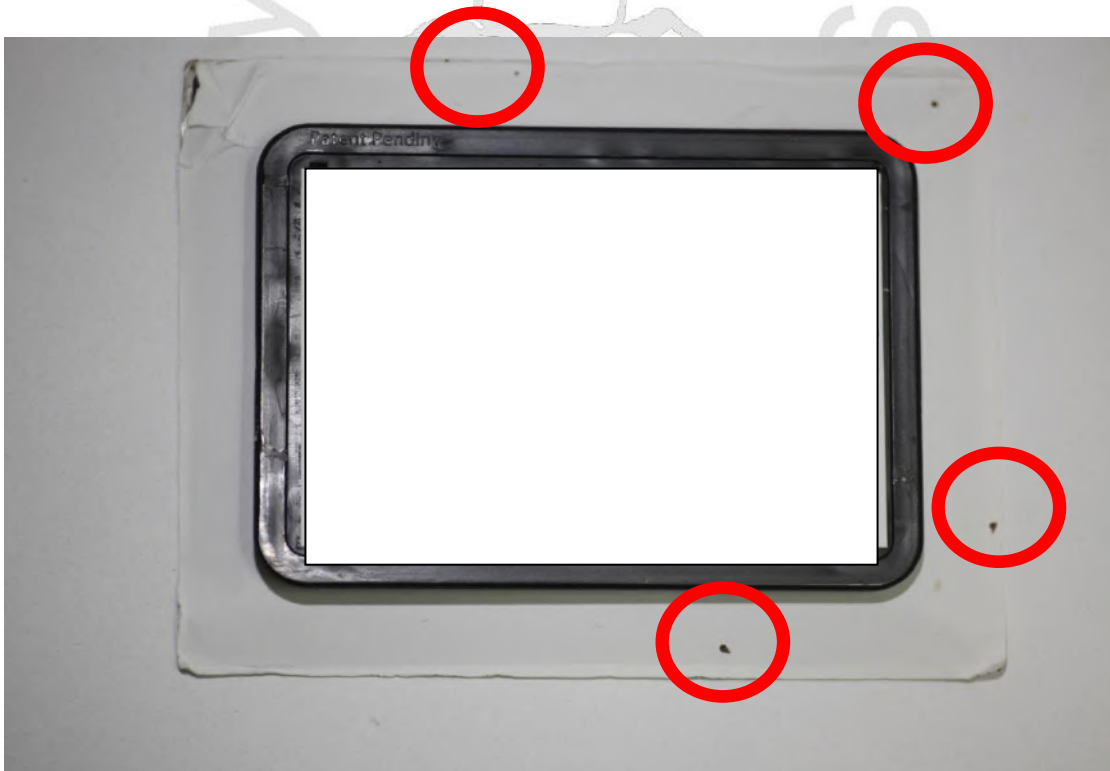
We have yet to need to chemically treat this particular location who have been doing their own front line non chemical bedbug control for 2 years now.



After a few months detection levels increased to a point where identification of infestations on individual beds rather than rooms was practical.



Even our most resistant clients were won over when they were able to detect down to a single bedbug.



Early detection avoided guest complaints as people are less likely to raise the alarm bell and seek compensation for 1 or 2 bites compared to several hundred.



Following an audit by environmental health this site were told that they had the best detection and due diligence system that the EHO had seen, praise indeed considering they had been threatened with closure 18 months early at 50% infected.



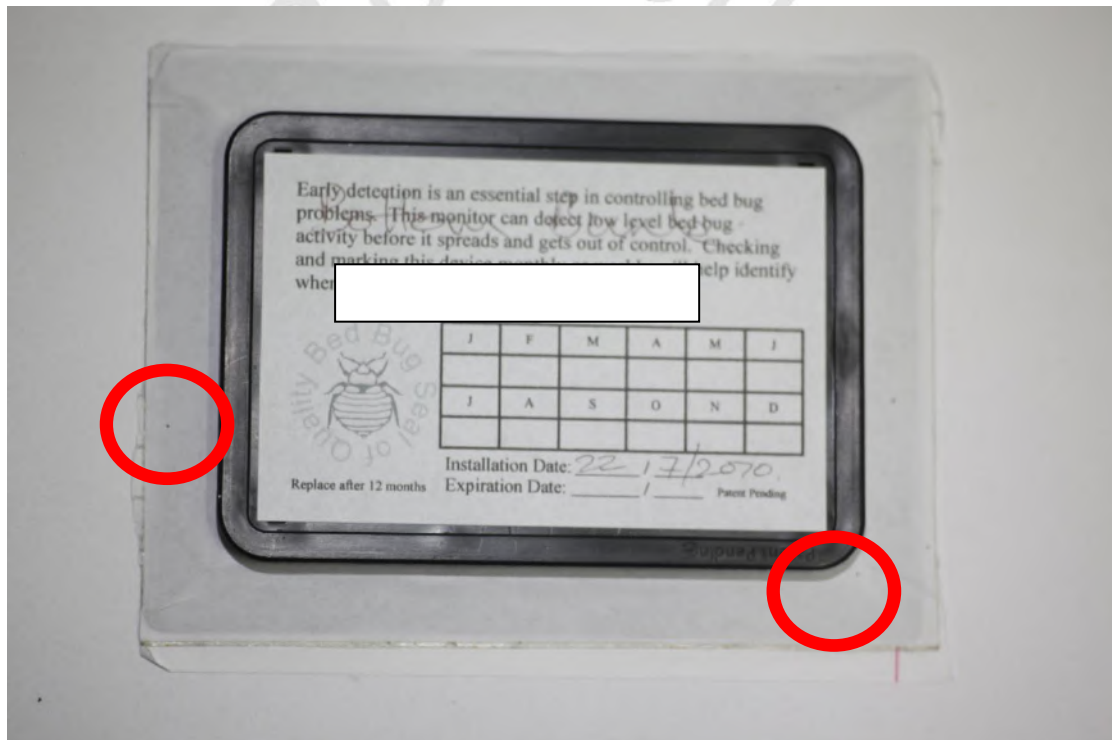
Light infestation can often be detected and eradicated using simple non chemical procedures in a few hours with no loss of earning.

Treatment via passive monitor replacement as a non chemical strategy

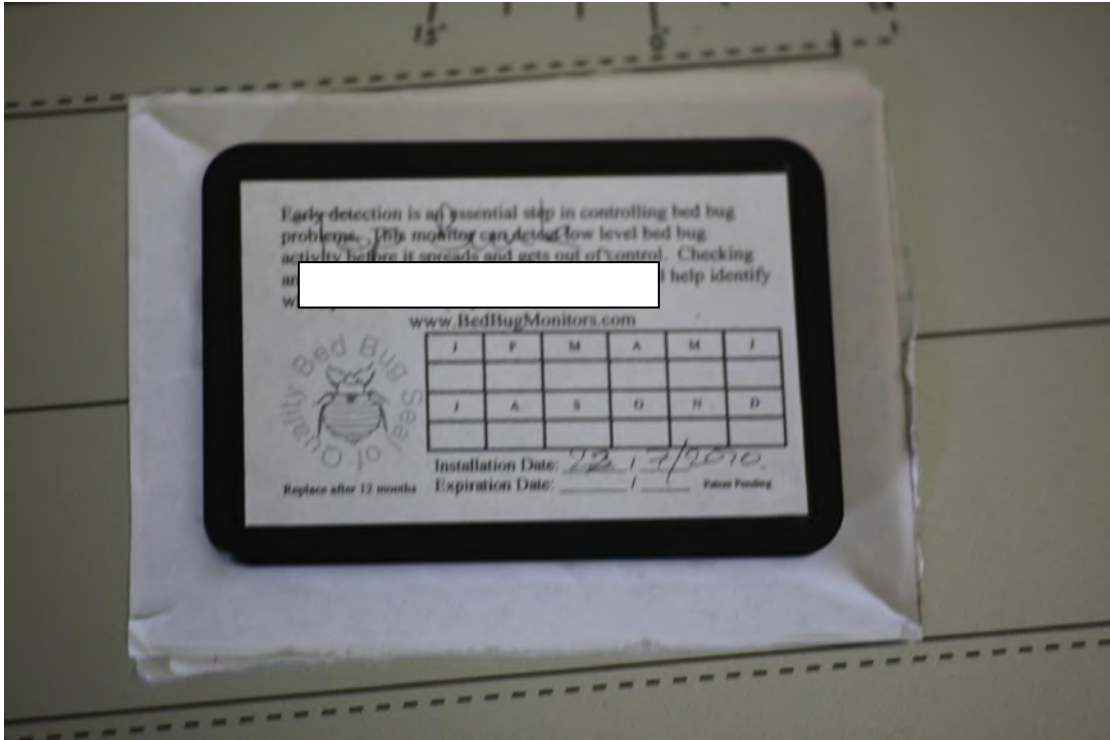
Increasingly consumers and the hospitality have been looking for non chemical treatment solutions. Due to the cryptic nature of bedbug and the difficulties with existing treatment strategies we have found this is only feasible in light infestations.

With a number of our domestic and commercial clients where feasible we have deployed this strategy, most notably in environments where chemical use could be problematic, such as healthcare and where children were involved.

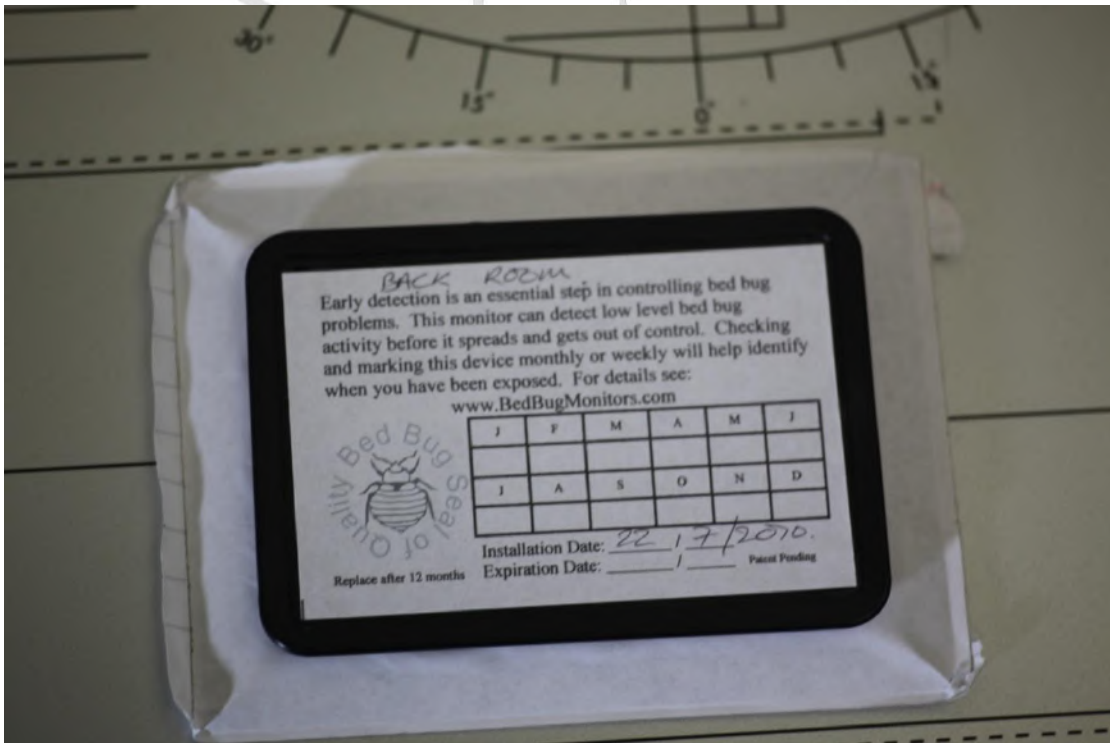
The following monitors were collected from a location which had three small children in two rooms. The protocol was to conduct a thorough inspect to manual remove bedbugs, the occupant then conducted a deep cleanse and installed the passive monitors. After 14 days the deep clean was repeated and the original monitors replaced with fresh ones. The replacement monitors were then checked every few days.



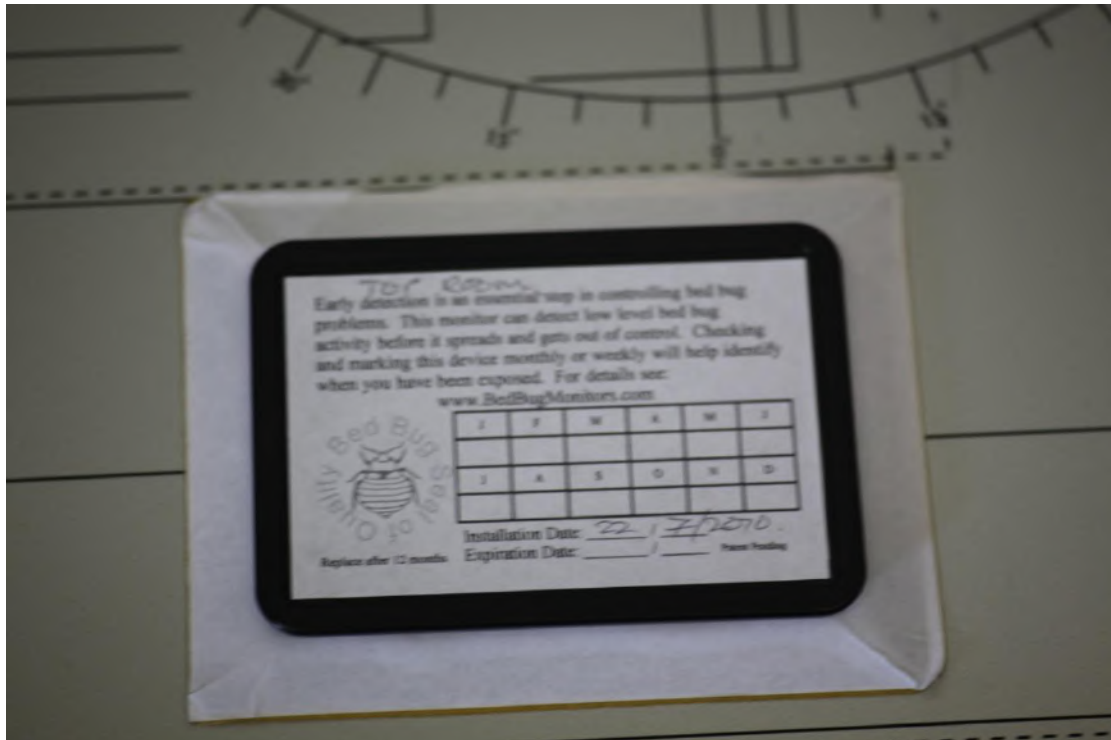
Two faecal traces on the monitor from the lower bunk bed.



No faecal traces found on the monitor from the top bunk.

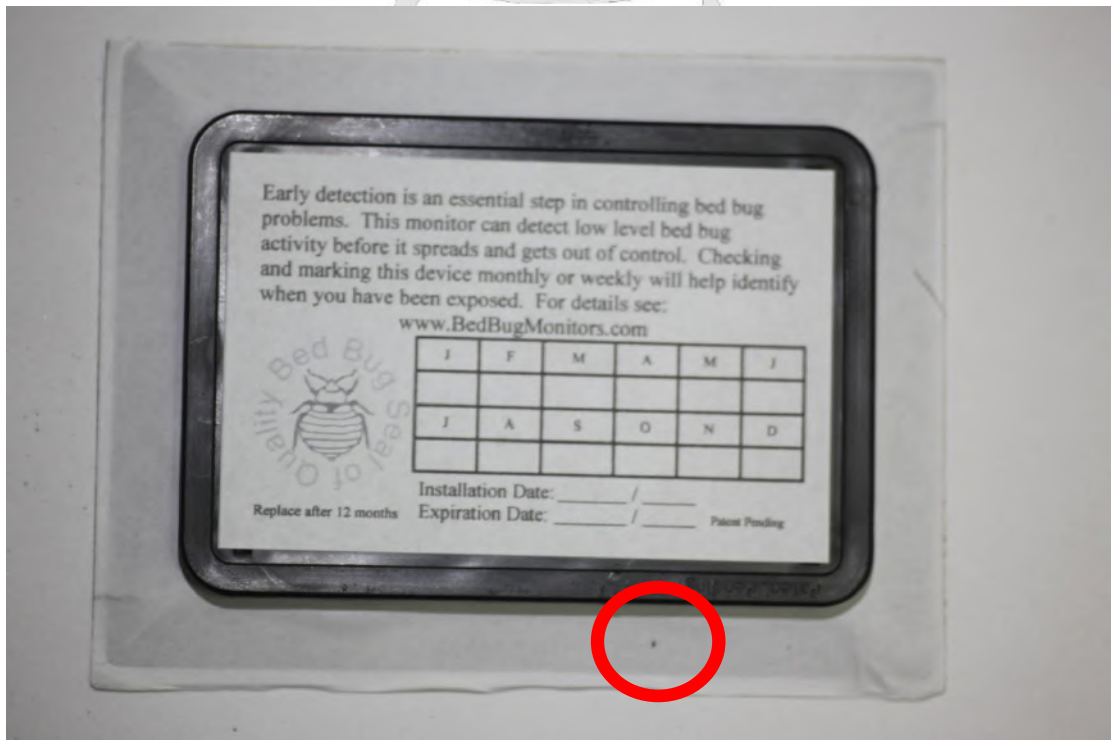


The back room was also clear.



The top room or parent's room was also clear.

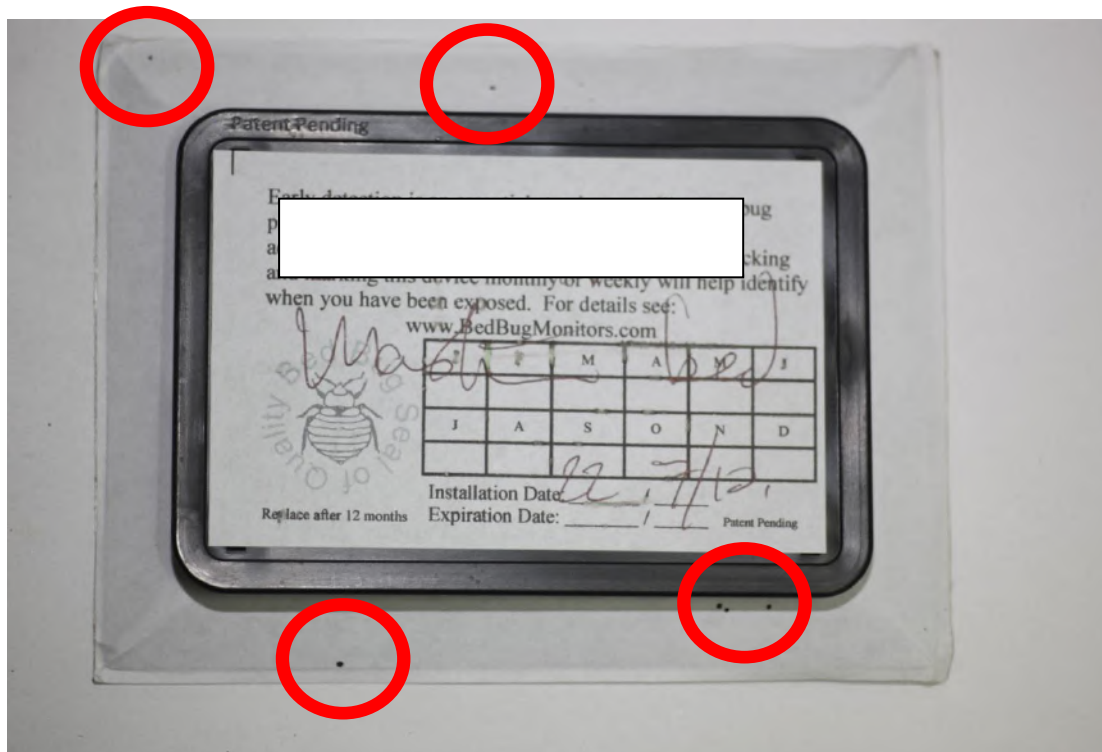
No further monitors were sent in for confirmation and the occupant reported the infestation had been resolved.



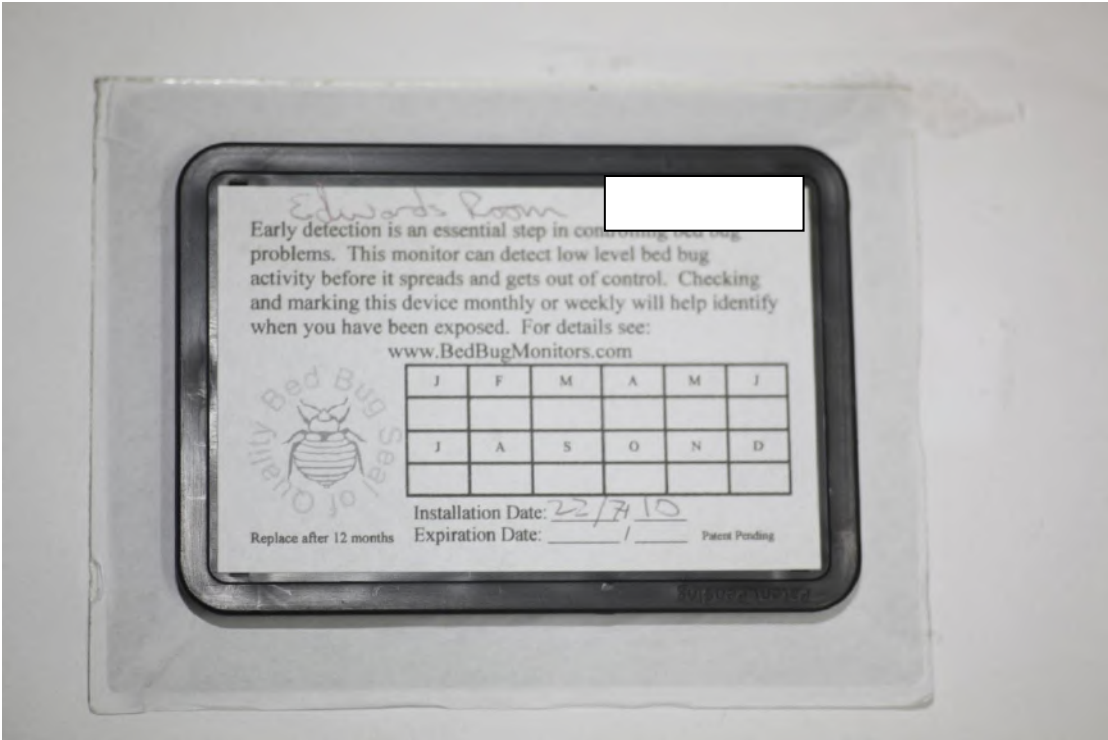
Single faecal trace deposited on a monitor following an overnight stay in an infected hotel room. The infestation was identified and resolved within 10 days without the use of chemical control.

Treatment with passive monitors as an adjunct to the treatment process

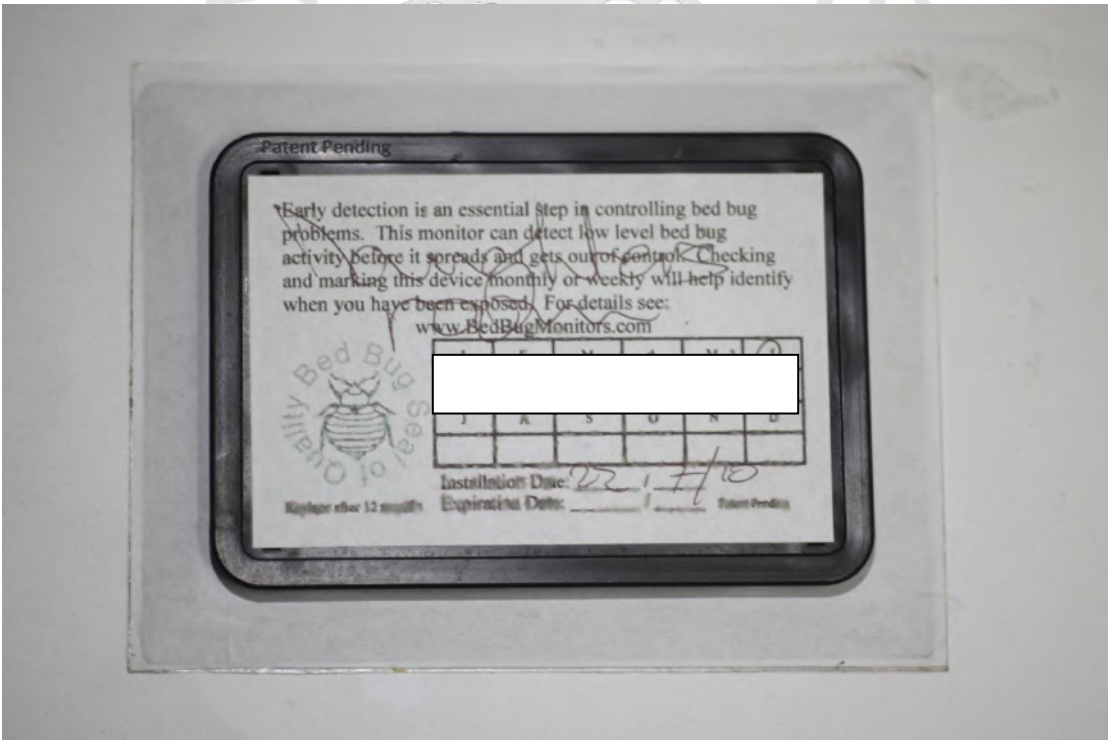
Although we are aware that some insecticides seems to have a scattering effect on bedbugs and that application of some products can reduce the efficiency of monitors we have trialled a few sites where passive have been used in conjunction with our normal treatment procedures.



Passive removed from source room 14 days after treatment using a thorough and detailed integrated pest management approach.



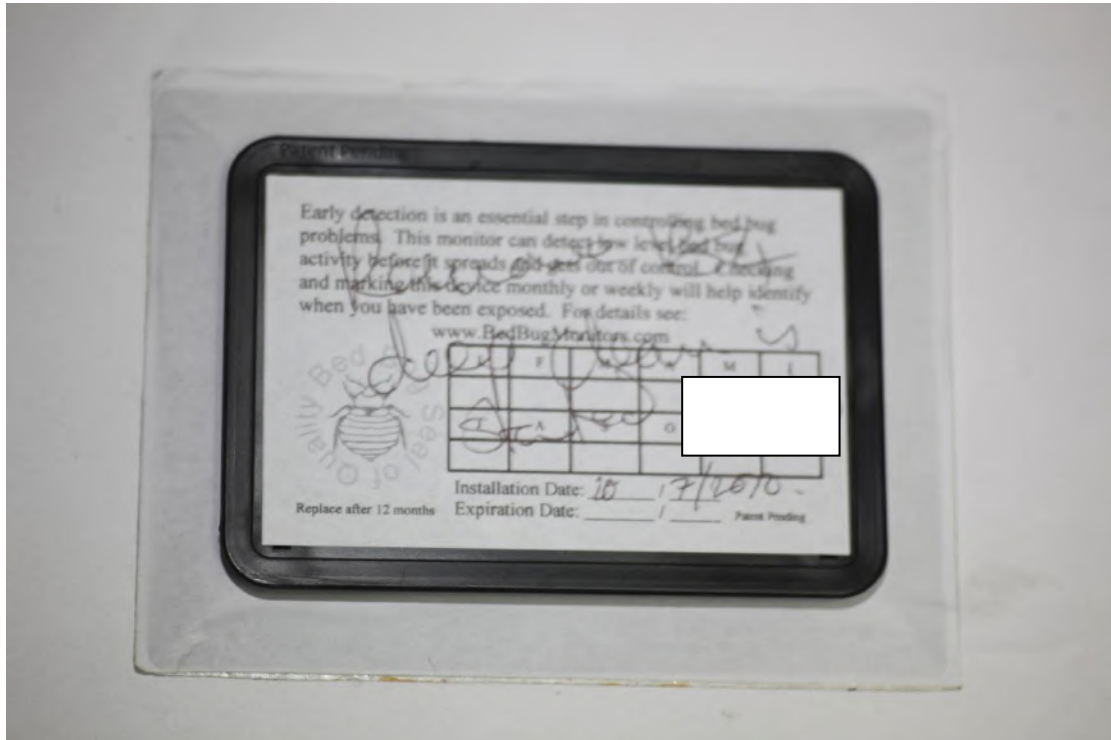
Passive confirmation that the infestation had not spread through to other bedrooms in the property.



Passive confirmation that the infestation had not spread through to other bedrooms in the property.

Post treatment monitoring

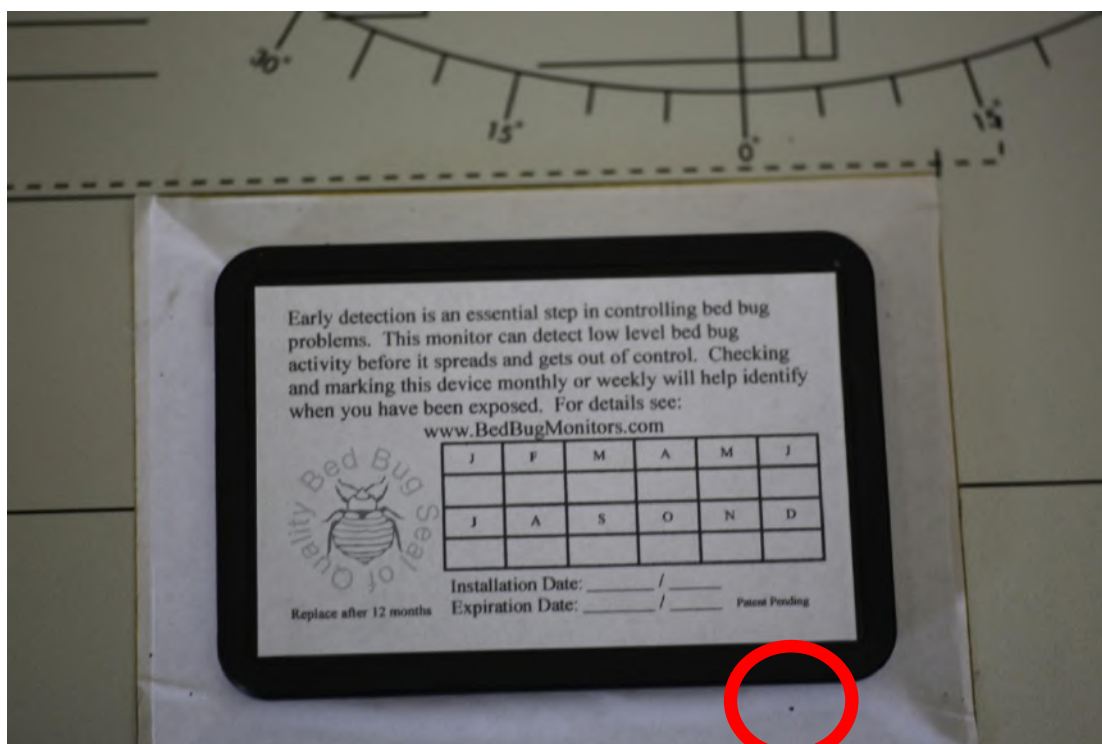
Many domestic and commercial clients are seeking confirmation that an infestation is resolved following treatment. In some cases we felt confident enough with the treatment program we deployed that we installed a passive at the end of the first treatment visit.



Passive indicating no further bedbug activity since the first treatment visit.

Monitoring of non occupied / non sleeping areas

We have had reports from people using passive monitors in completely unoccupied locations such as offices and cleaning cupboards in hotels. As there is no active attractant in the system we can only assume they have a high affinity to the materials selected and that the harbourage instinct is sufficient to make the passive more appealing than others locations.



Passive installed in a work environment illustrating that a domestic clients source may have been connected with either the work location or the journey to work.

Conclusions

Monitoring for ingress as the focus of an integrated inspection process

Like all processes and systems within an operational environment when working well they increase in efficiency with operational use. Our complete install clients have found that they are dealing with lighter and lighter infestations with a number of sites now fully operational providing their own front line treatment.

Dealing with lighter infestations has increased guest confidence that the issue is being resolved and reduced the numbers of complaints and subsequent requests for compensation.

Many hostels have reported that the logic and processes of a proactive approach to bedbug control have given them a framework to “take control” of the wider issues within the building and structure many house keeping and maintenance routines around it. Infestations have reduced in some cases from significant double digit levels to a rolling 1% – 3% depending on guest change over rates.

Staff moral has also notably increased on two of the larger sites as the emotional drain of fighting a spreading bedbug infestation was lifted from their shoulders.

Treatment via passive monitor replacement as a non chemical strategy

We have illustrated that either through proactive monitor replacement and deep cleanse or inspection – deep cleanse – monitoring and repeating the deep cleanse can resolve both light and recently introduced infestations.

We have expanded on the principles of this approach in the advanced educational section of our website on this subject and feel it has significant potential as a wider and long term solution to dealing with bedbugs in the face of increased reports of chemical tolerance.

Most light domestic infestations can be confirmed as resolved with 15 days and continued ongoing monitoring also ensure that should an exposure event occur again there is a low risk of the infestation spreading throughout the property.

The system worked best in situations where there had been no chemicals used before the assessment and infestations where still relatively localised.

Treatment with passive monitors as an adjunct to the treatment process

In some situations, most notably in cases outside of London where the aim is to resolve all feasible infestations in one visit the use of passives did help in light and medium infestations.

They again worked best in situations where there was no previous treatment and insecticide application was avoided in the area where the monitor was installed. In approximately 75% of the cases a revisit was not necessary although in the more aggressive cases a second round of monitor replacement could resolve the infestation as long as there was not a continually introduced source.

We envisage that within the next few weeks all treatment procedures will be re-written to incorporate the use of passive monitors for all infestations less than 7/10 on our scale and that all infestations <3/10 will be offered non chemical treatment based options.

Post treatment monitoring

In high critical treatment situations such as highly allergic occupants passive monitoring gave a reliable option to detecting rogue or recently reintroduced bedbugs. We also have feedback from non chemical treatments such as thermal remediation that indicate that passive monitors are proving more reliable than other detection systems include scent detection as there are no possible false negatives with the detectable signs.

Monitoring of non occupied / non sleeping areas

With increasing concern about workplace and non sleeping area based infestations we have tested the passive in field conditions. With reports of identification in offices, lounges, waiting areas, cleaners cupboards and vehicles we know it is feasible to use passives as part of a detection strategy but acknowledge that more field studies are needed.

We have observed faecal deposition from both fed and unfed bedbug in field conditions indicating that the harbourage seeking instincts of bedbugs transported into a location further advocates the role of monitoring as the starting point for any integrated pest management program within both commercial and domestic settings.

We are planning to start a vehicle based release and capture study in the next few months to establish the best installation location for vehicles

Ongoing projects

We continue to seek to conduct more field trials of the passive monitoring technology and will soon be in a position to report back on our first healthcare complete install to help resolve a continual exposure issue in a residential care home.

We are actively recruiting sites in the entertainment sectors, office space, restaurant sectors where we are starting to see increased UK activity from.

Closing Remarks

This report is based on field data collected between 2009 and 2011 by Bed Bugs Limited in conjunction with clients. Site confidentiality has been assured but further details can be discussed under appropriate agreements.

This report reflects an accurate assessment of some of the field data collect on the use of passive monitors to illustrate the operational efficiency of the system. Every effort has been made to ensure that all facts and statements are correct. Some of the monitors are available for visual inspection and confirmation of these finding by making an appointment to visit our Battersea facility.

Regards,

David Cain
Managing Director
Bed Bugs Limited