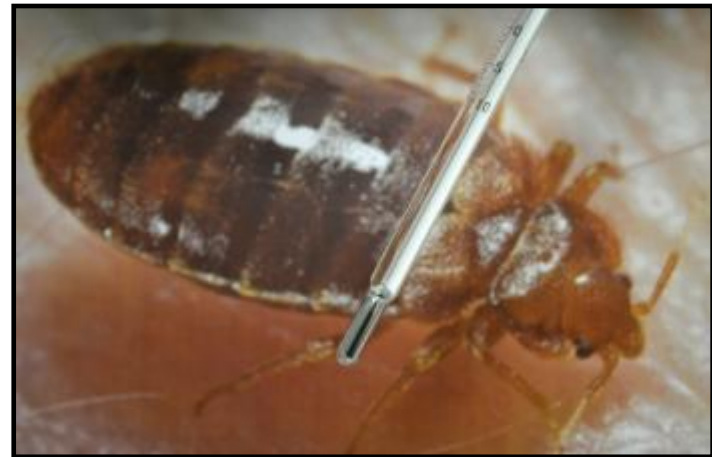


Practical Heat Treatment and the control of Bed Bugs

Presentation to Skadedyrdagene 2016
Oslo, Norway, March 10th 2016

By:
Dr Peter Whittall
Executive Director of Tripod Consulting Ltd



Agenda...

- A brief history of bed bugs
- Why are they so difficult to treat...?
- Principles of heat treatment...
- Practical considerations and war stories...
- Questions...



Photo of Traumatic Insemination.

Bed Bugs used to be commonplace....



May the
destroyers of peace
be destroyed by us.
TIFFIN & SON,
BUG-DESTROYERS TO HER
MAJESTY

*“We do the work by contract,
examining the house every year as a
precaution since servants are apt to
bring bugs in their boxes...”*

-- T. Tiffin, 1695

We knew how to live with them, and how to deal with them....



- People knew what to look for.
- They were less of a taboo. Many homes also had them.
- Hotels knew how to control the risks, and were vigilant.
- PCOs had less restrictions and were used to dealing with bed bugs every day.
- *Then they disappeared, and we forgot everything we knew.....*

Where did they go?

DDT was so effective that bed bugs disappeared for many years



but now they are back...

Health fears as bedbug infestations rise 66%

by Conor Kane

BEDBUG infestations here are up by two-thirds, according to experts in pest eradication.

Entomologist Professor Michael F...

Bed bugs infest Listowel hospital

ANNE LUCEY

AN INFESTATION of bed bugs has been found at a hospital in Listowel, Co Kerry. Patients who have cancelled appointments because of the infestation have been told that the problem is being dealt with.

Visiting patients at the hospital have been told that the problem is being dealt with. The hospital is currently closed to new admissions.

Public health officials are concerned about the spread of the infestation. The hospital is currently closed to new admissions.

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Bed bugs on the increase

BED bug infestations are spreading across Ireland, it was warned yesterday. Rentokil Pest Control have revealed they have had call-outs from 19 Irish counties so far this year. And the number of treatments was up 90 per cent compared to 1996. The most common areas for outbreaks are in hotels and hostels.

Pest expert Prof Michael Potter said: "Bed bug infestations have become a global epidemic and are increasing because of increased travel."

The HSE said there was not related to an increase in infection control standards.

Dublin and at European countries. "Ordinary" more about what they can do to reduce their infestations, acquiring furnishings, as children need to be at university or summer camps, etc. We're in the grip of an invasion of bed-bugs in other countries. In London, the problem is so bad that it has become a major issue for the city. The problem is so bad that it has become a major issue for the city. The problem is so bad that it has become a major issue for the city.

YOUR HOME

Bedbugs Are Back, And on the Attack

By JAY ROMANO

THEY'RE about one-eighth inch long, reddish brown in color, with oval, flattened bodies. Though flightless, they skitter quickly over floors, walls and ceilings. They are world travelers, hitching rides in suitcases and clothing, and world-class squatters, equally happy in four-star hotels and in

furniture at garage sales, flea markets and even off the curb. Chad Grosklags, vice president of U-Spray, an Atlanta supplier of pest control chemicals, said that once inside a house, bedbugs can hide behind baseboards, moldings, window and door frames, picture frames, light switches, headboards and, of course, in the soft, dark recesses of mattresses and box springs.

BEDBUGS SPARK LAWSUIT US tourists itching to sue hotel

JOHN DUNNE @thedunnepaper.com

AN AMERICAN lawyer and his wife are suing one of London's swankiest hotels after claiming their stay was made a nightmare by bedbugs. Sidney and Cynthia Blum said they expected a luxury stay at the Mandarin Oriental Hotel in Hyde Park to be a favourite haunt of the rich and famous. Instead, they found a room infested with bedbugs.



THE CASE | Mandarin Oriental Hotel in Hyde Park carried out and the problem fully rectified. There have been no subsequent cases. The matter was resolved.

the west.com.au

News Business Sport Entertainment Travel Opinion Regionals Community West TV

Bed bugs back biting

23rd September 2008, 7:45 AM

Like creatures from a horror movie, bed bugs are feasting on hapless holidaymakers' flesh and stopping only to multiply. Their numbers declined until about 20 years ago - rendering risks to travellers within Australia and many other parts of the world relatively low. But the bugs have bounced back - with a vengeance.

"I've seen a mind-boggling 7800 per cent increase in reported cases of bed bug infestation in Australia since 2003," reveals Garry Jones, operations manager at Sydney-based Ecolab Pest Elimination Group.

"That's utterly astounding," adds Jones, who belongs to an academic working party studying ways to combat the pesky critters.

"Reported cases in Australia have increased by 4,500 in the past eight years," says Stephen Doggett, senior research scientist in the medical entomology department at Sydney's Westmead Hospital.

"No part of Australia is free of bed bugs," notes Doggett, an internationally-respected authority on the bothersome creatures, which clearly are on the march.



and not just in hotels....



NEW YORK POST
24 HOURS A DAY

HOME NEWS SPORTS PAGE SIX BUSINESS ENTERTAIN

30° CLEAR

Columnists Politics Local Bronx B'klyn Manhattan Queens

SUBWAYS' BLOOD-BUG INVASION

By PATRICK GALLAHUE, JOHN MAZOR and SYLVIA HARVEY
May 8, 2008

Don't let the bedbugs swipe!

The blood-sucking insects aren't just living with New Yorkers at home - they're on the subways, too, according to one of the city's leading bedbug authorities.

At a recent Department of Housing, Preservation and Development forum on the subject, a city bedbug educator admitted to seeing the pests on benches in subway stations - in one case, catching a ride on an unsuspecting straphanger's caboose at Brooklyn's Hoyt-Schermerhorn station, according to people at the meeting.

The official, identified as Edward Brownbear, also reported seeing the bugs on wooden benches at the Union Square and Fordham Road stations in Manhattan and The Bronx, respectively.



A bench in Union Square station that city officials say are possibly infested with bed bugs.



There have been reports of bed bugs on trains in the US, Europe and in Asia



Why are they are back...?



- Travel?
- Immigration / Migration?
- Loss of the most effective (toxic) chemicals?
- New Pest control protocols (e.g. gels)?
- Resistance?

Agenda...

- A brief history of bed bugs
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Photo of Traumatic Insemination.

Why are they so difficult to control...?



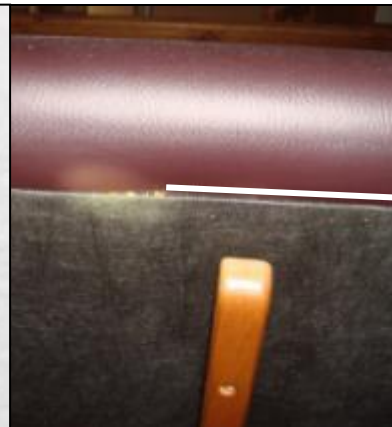
They are very small & very thin..

So they are very good at hiding....

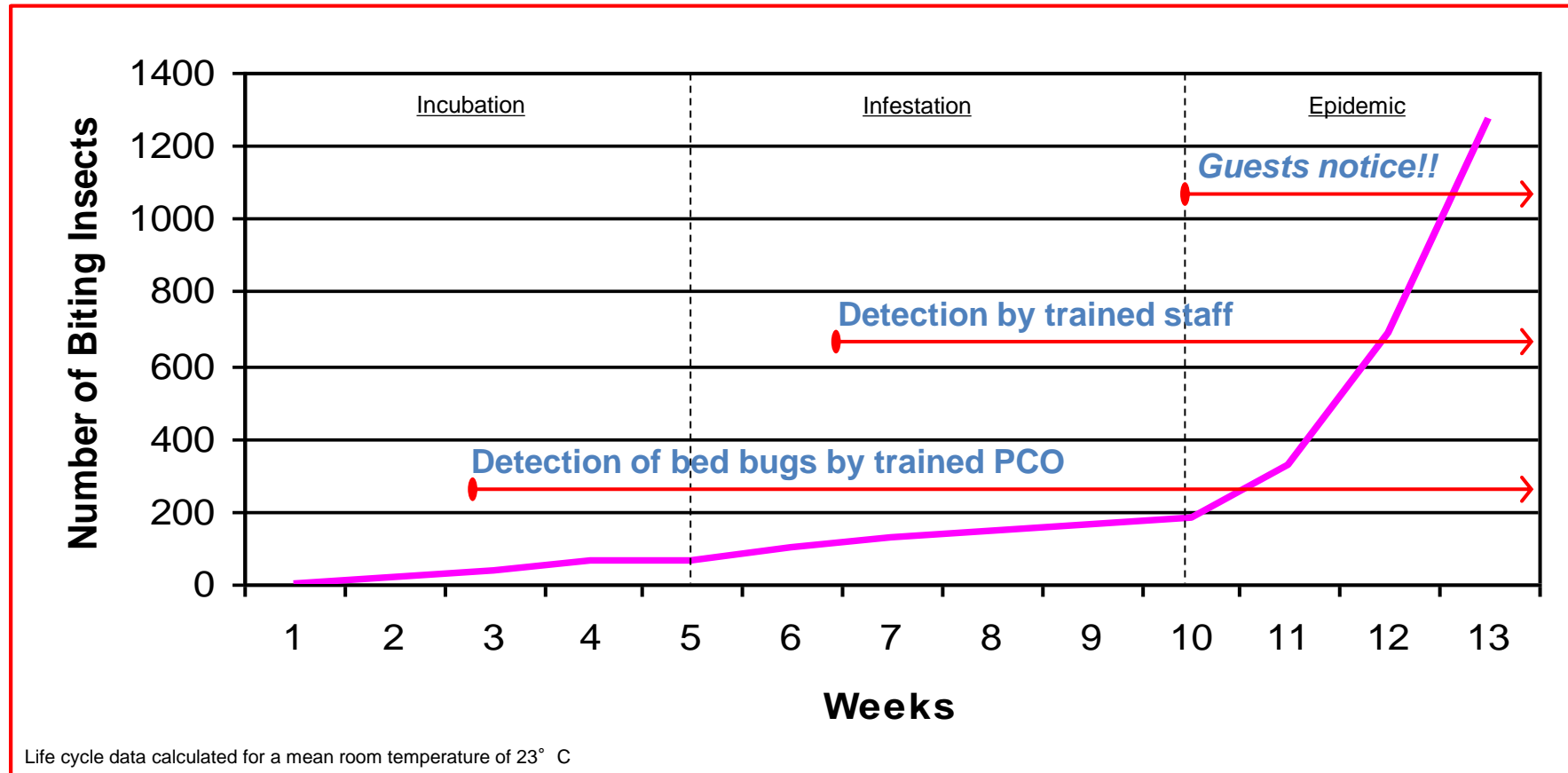
- Cracks
- Nail holes / recessed screw holes
- In wood joints and knots in wood
- Flaked paint / wallpaper
- Mattress seams
- Behind headboards
- In the base of the bed
- In the carpet edge and skirting
- In fact anywhere there is the tiniest gap!

Early detection is essential...

and it takes a real professional!!



The longer it takes to spot an infestation, the harder it is to control – and the bigger the impact on your business.



- *Illustrates the importance of getting to the eggs...*
- *Most biocides are ineffective unless you get direct content...*
- *Hence the need for new approaches...*

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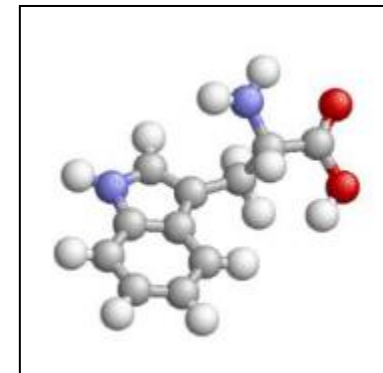
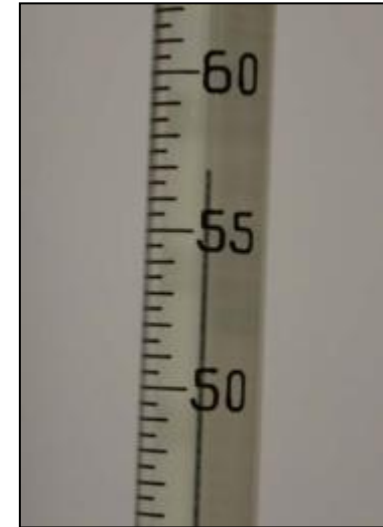


Photo of Traumatic Insemination.

Theory...

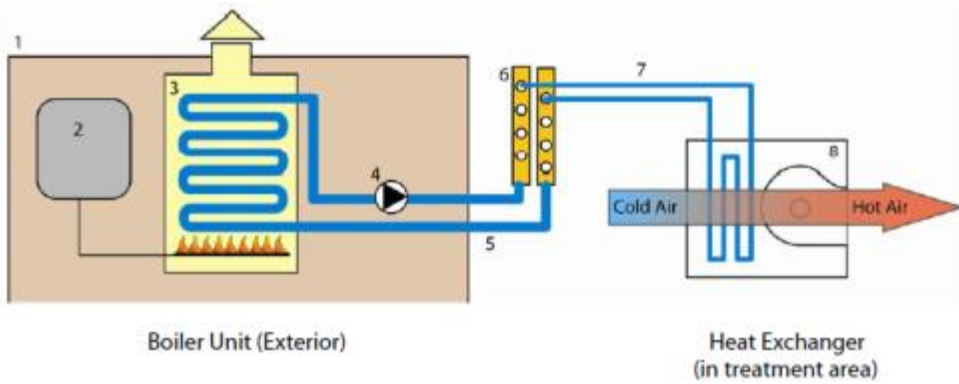
Principle

- Heat kills all insects
 - Controls all life stages (adults, nymphs, eggs)
 - Used in quarantine treatments
- Dry heat with slow rise from ambient is key
- Viewed as a replacement for traditional fumigations (similar skill / mentality...)
 - Heat will penetrate and travel like a fumigant
 - Safer than conventional fumigants
- 'Green' technology
 - Pesticide free
 - No residues (but no residual action!)
- Fast treatments
 - 100% kill in hours
 - Room is available immediately

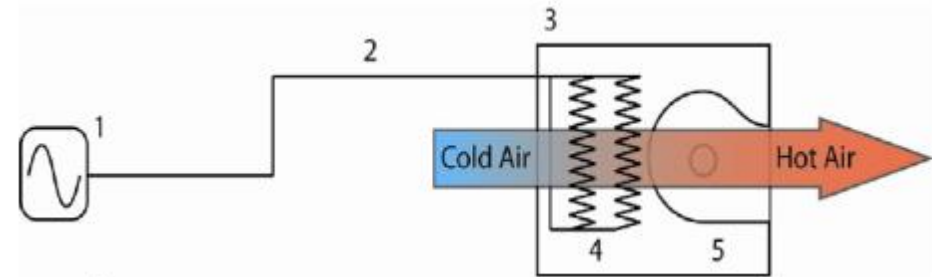


Types of system...

Hydronic



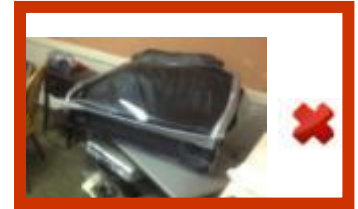
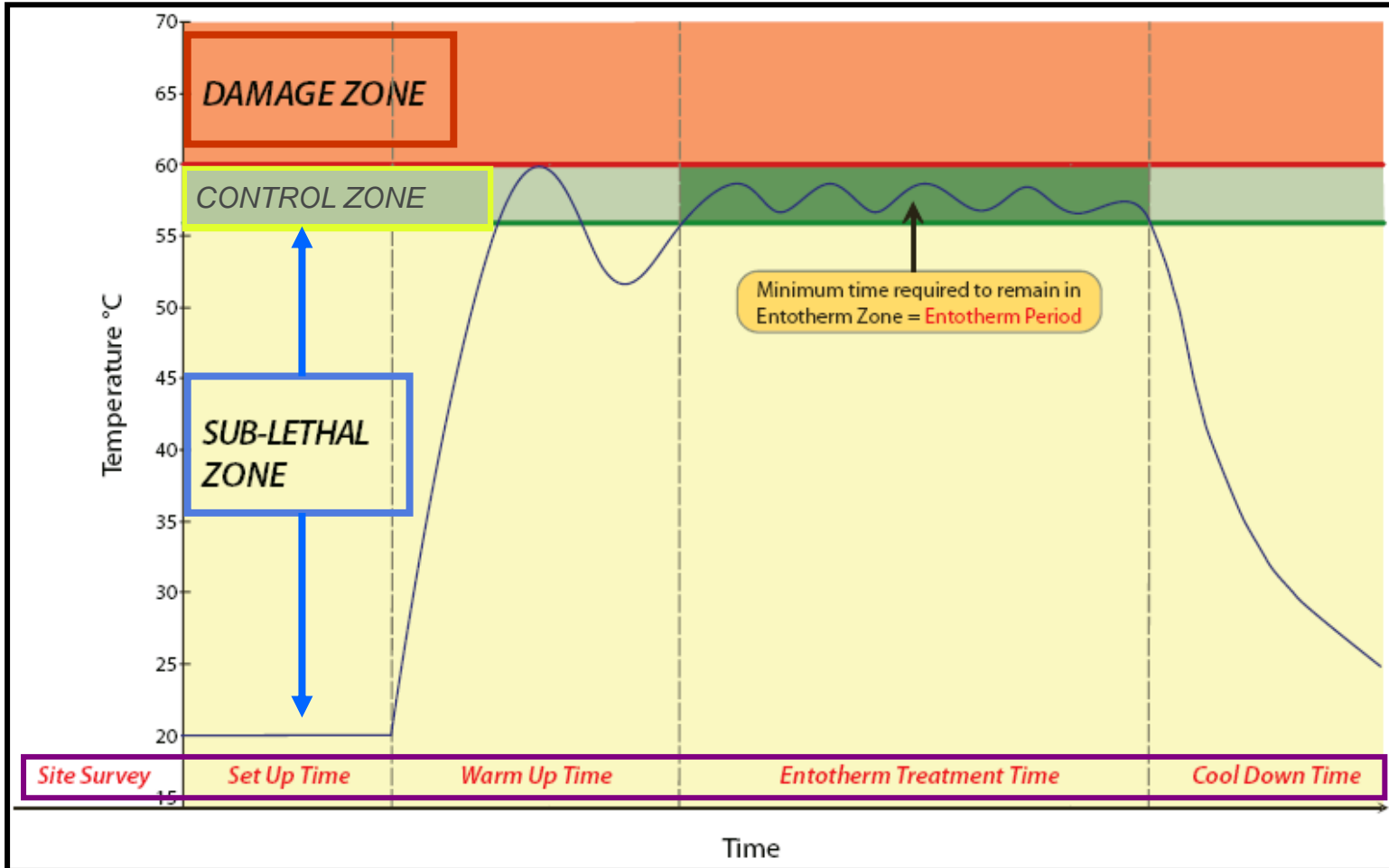
Electrical



Chemical



The Heat Process...



TRUE EXPERTISE REQUIRED !!!!!

Getting it consistently right requires a *high level of expertise* - and for us not to get it wrong



<h2 style="color: green;">Correct Zone</h2> <ul style="list-style-type: none"> - Make a profit - Build our business 	<h2 style="color: orange;">Damage Zone</h2> <ul style="list-style-type: none"> - Costs us money - Damages our reputation 	<h2 style="color: orange;">Failure Zone</h2> <ul style="list-style-type: none"> - Costs us money - Damages our reputation
To remain in this zone	To remain out of these zones	
<p>3</p> <ul style="list-style-type: none"> • Correct temperatures for sufficient time in ALL areas 	<ul style="list-style-type: none"> • Ensure temperatures remain below damage level 	<ul style="list-style-type: none"> • Ensure all infested cold spots remain at kill temperature
<p>2</p>	<p>Effective, safe and compliant equipment</p>	
<p>1</p>	<p>Expert training, experience and validation</p>	
<p> Comprehensive procedures, risk assessments and records</p>		



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Photo of Traumatic Insemination.

Basically its all about getting the right time & temperature...

The real life challenges...

- All buildings are **not** the same...:
 - Construction
 - Contents
 - Adjacency
- Temperature differences within the treated area ('cold spots')
- Temperature measurement equipment margins of error
- Variations due to operator skill and standard procedure.

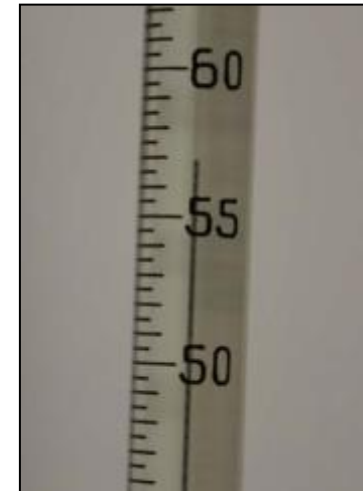


	<i>Material</i>	<i>Thermal Conductivity W/m/°C</i>	
<i>Better conductors / poor insulators</i>	Brick	0.6	<i>Better insulators / poor conductors</i>
	Water	0.6	
	Wood*	0.1 – 0.4	
	Concrete*	0.8 – 1.3	
	Glass	1.2	
	Granite	2.1	
	Iron	80.4	
	Aluminium	204.3	
	Copper	390.0	
		<i>* depends on type / species</i>	

This is a highly skilled job...failure to appreciate this affects your margin!

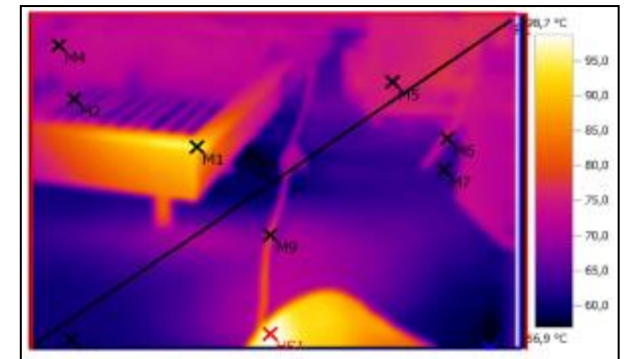
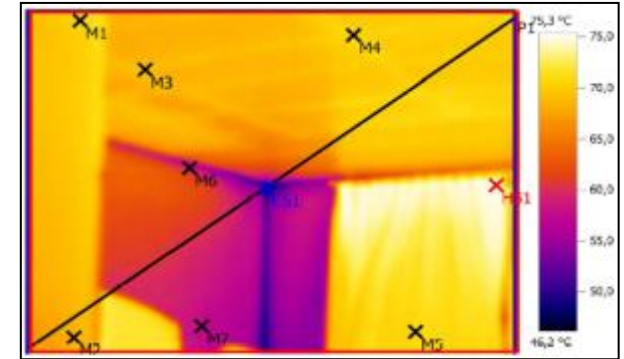
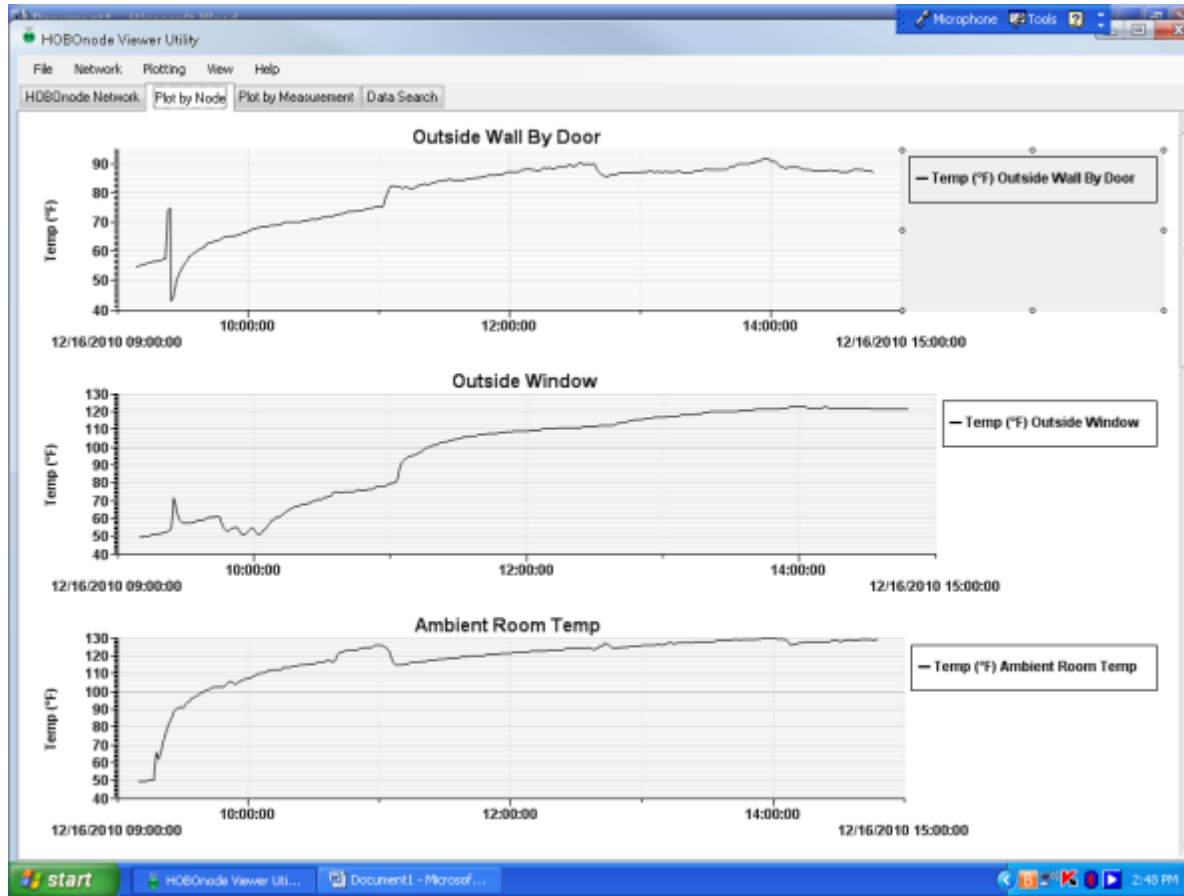
Maintaining a killing zone...

- Practical temperatures and exposure times for killing bed bugs are 'substantially higher' than previously thought in the industry.
- Bed bug eggs are the most difficult stage to kill with heat
- For bed bugs you must target killing 100% of the eggs
- Actual 'core' temperature in the most insulated space in the treatment area must not fall below 48°C for at least 72 minutes
- The temperature probes some businesses use can have a measuring error of up to 5°C
- Temperature dips below target levels will result in the 'clock' of exposure time restarting – leading to longer treatment times. An additional buffer of 2°C would give enough time to operators to prevent this



Heat Treatment for bed bugs should target a minimum temperature of 55° C for 2 hours*.

The challenge of heat distribution...



You should always set a cold probe and set your control times against this

When things go wrong...



Date: _____ Taken By: _____

Service Location/Unit 307 chestnut st.
w. chester, pa

Location Description:	Bathroom ambient	Kitchen stove ambient	cold livingroom	ambient dining rm.	
Reading Times	Probe 1	Probe 2	Probe 3	Probe 4	Probe
10:30	112	97	83	119	
10:45	131	112	95	144	
11:00					



...and consequence of sub-standard monitoring.

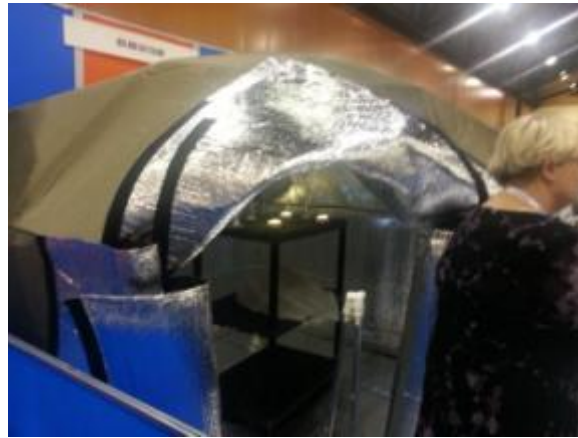
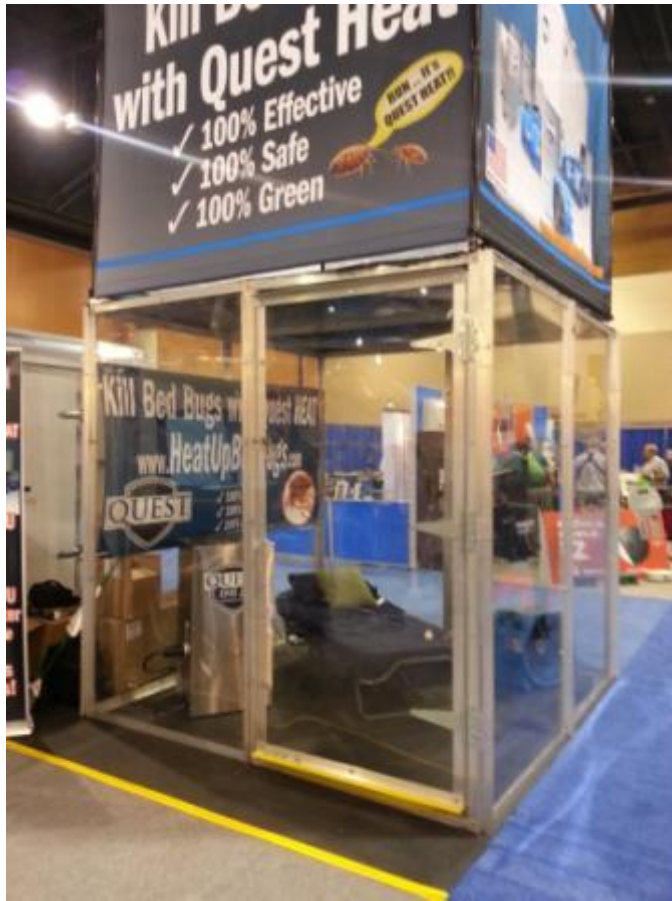
Times & temperatures for other pests...

Pest	T / °C	Time / mins
Bed Bug Eggs (LD 99)	55	60
	50	120
Clothes Moths	49	11
Tobacco Moth	64	5
Furniture Beetle	48	60
Death Watch Beetle	55	60
House longhorn beetle	52	150
Powderpost beetle	54	20



N.B These are laboratory results – practical operations need to build in factors for temp calibration etc

...and a 'future'...?



Treating articles...



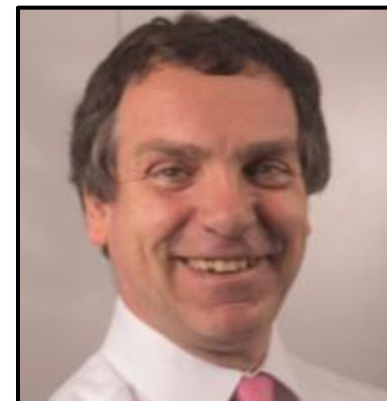
Contact Details:

Mobile:

+44 (0) 7866 457473

E Mail:

tripod@whittalp.freeseerve.co.uk



Dr Peter Whittall
Executive Director - Tripod Consulting Ltd

