

## **Modifications to the BB CoP 4<sup>th</sup> Edition from the 3<sup>rd</sup> Edition, Mar/2013.**

Note that minor rewording and grammatical changes are not listed.

**Section 1** (Preface to the Fourth Edition), page 6: Mention of Diatomaceous Earth Dust now available.

**Section 1** (Preface to the Fourth Edition), page 6: Added; "...the use of any management device not specifically supported in this CoP is not recommended".

**Section 3** (Document Administration & Review), page 7: Reference (Orton 2010) added. The defining of the Working Party is expanded.

**Section 4** (Limitations of the CoP), page 8: Added to the end of the first paragraph; "If a product within the CoP is being promoted in a manner based on unsubstantiated claims, the company will be seen not to be promoting 'best practice' in bed bug management and the product may be removed from subsequent editions of the CoP."

**Section 5** (Scope of this CoP), page 9: The series of dot points on the effective measures identified that may be employed against bed bugs has been updated.

**Section 6.3** (Accommodation Industry), page 11: New Section under 'Required Philosophies', which includes a discussion and definition on Due Diligence.

**Section 7.1** (Pest Managers), page 12: Added to second last paragraph; "Companies and Pest Managers who undertake bed bug management should review industry developments on a regular basis. It is preferable that only sales staff who have practical experience in bed bug management provide quotes on bed bug jobs, to avoid inaccurate costings."

**Page Section 7.2** (Accommodation/Housekeeping Staff), page 7.2: Added to the end of this section; "Other staff who may have to deal with affected guests or those responsible for ensuring that control of infestations are undertaken, should also receive specific training in bed bugs. This may include front of house, managerial and maintenance staff."

**Section 8.2.1** (Guest Complaint), page 15: Added to last dot point, second sentence; "Inexperienced individuals may not readily detect an infestation if it is in a poorly accessible location such as behind a bed head."

**Section 8.2.1** (Guest Complaint), page 15: Added within third dot point; "within the incident report"

**Section 9** (Occupational Health and Safety), pages 15-16: OH&S split into two

sections. Added under Section 9.1. (final paragraph); "Pest Managers should minimize the risk of exposure to bed bug allergens by only using vacuums fitted with HEPA filters (Section 17.1.3) and by wearing dust masks particularly in heavy infestations or dirty environments. Pest Managers should also undertake measures to minimise the risk of spreading bed bugs on their own belongings and clothing. It should be company policy that white clothing is worn, which enables bed bugs to be spotted more easily, and disposable overalls and shoes should be used which are placed into sealable plastic bags at the completion of treatment and labelled for disposal. Spare clothing should be carried and all worn clothing should be placed into sealable plastic bags, and subsequently laundered as described in Section 17.1.4. All equipment should be stored in sealable plastic containers."

**Section 10** (Choosing a Pest Manager), page 16: New dot points added to help clients find a reputable pest manager for bed bug management, including; "Request from the Pest Manager a copy of their license and check to see it is current", "Request past management plans for similar situations (the Pest Manager must ensure names are removed for confidentiality)", "It is important that individuals rather than the company should have bed bug training." Some additional wording added to several dot points.

**Section 12.2** (Bed Bug Indications), Page 18: Second dot point amended to; "Faecal spotting. This is digested blood defaecated by the bed bugs. It may be initially observed on the sheets, but will be commonly noticed along the mattress seams and other places where bed bugs hide. On light coloured surfaces individual faecal marks appear as small dark round spots, however the spotting may be in colour from cream, through grey to almost black. Generally the spotting, will occur in groups and appear as splotches of dark marks (see Figures). Note that the faeces of nymphal cockroaches appear similar, however bed bug blood spotting tends to occur in groups as the insect by nature aggregates. Red blood coloured spots or smears on the sheets may occur which can be the result of bed bugs passing sera, or engorged bugs being squashed by movements of the sleeping host."

**Section 13.2** (Client Responsibilities & Preparation of Infested Sites), page 24: Second last dot amended to; "If possible the client should provide the Pest Manager with a plan of the building so that the bed bug infestation/s can be recorded where detected. This is especially critical for hotels, as the Pest Manager will need to determine which adjoining rooms require inspection."

**Section 14.2.1** (Hotels), page 25: Added to last the end of the paragraph; "Such staff should also be questioned about laundering procedures and general housekeeping processes."

**Section 14.2.4** (Bed Bug Detection Dogs), Page 27: Information on recent

investigations that demonstrate poor performance of bed bug detection dogs added.

**Section 14.2.4** (Bed Bug Detection Dogs), Page 27: Abbreviation 'NESDCA' corrected.

**Section 14.2.4** (Bed Bug Detection Dogs), Page 27: Added at the end of the second paragraph; "The National Pest Management Association of America (NPMA) has recently defined standards for the certification of bed bug detection dogs and their handlers (NPMA 2011)."

**Section 16** (Bed Bug Management Plans), Page 32: Section title changed to "Bed Bug Management Plans".

**Section 16.1** (Proactive Management Plan), Page 32: New section.

**Section 16.2** (Eradication Management Plan), Page 33: Separated from Section 16.1 and renamed "Eradication Management Plan".

**Section 16.2** (Eradication Management Plan), Page 33: Added to the second sentence; "This plan can be seen as a one off treatment regimen as opposed to a long-term proactive management plan."

**Section 16.2** (Eradication Management Plan), Page 33: New dot point; "For commercial dwellings and/or managed facilities such as public housing, a review of past bed bug infestations in the building. It may be necessary to speak to staff and tenants in order to provide a complete history of bed bug activity."

**Section 16.2** (Eradication Management Plan), Page 33: New dot point; "Realistic expectations of the treatment."

**Section 17.1.2** (Disposal of Infested Items), Page 34: Change of heading title from 'Hygiene'.

**Section 17.1.2** (Disposal of Infested Items), Page 34: First sentence amended to; "Reducing the overall biomass of a bed bug infestation can be achieved through discarding infested furnishing, although complete control will not be achieved."

**Section 17.1.2** (Disposal of Infested Items), Page 34: Added to second last paragraph; "Disposal of items should be co-ordinated with waste disposal collection."

**Section 17.1.3** (Physical Removal), Page 35: Figure 13 (Vacuum image)

deleted as this unit contained no HEPA filter.

**Section 17.1.3** (Physical Removal), Page 35: Section changed from; "Vacuuming insects can cause a dispersion of insect allergens, which may be a problem in sensitised people and trigger an asthmatic reaction. If clients report being sensitive to dust mite or insect allergens, then using a vacuum machine with a HEPA filter is advisable." To; "The allergens from bed bugs are known to trigger asthmatic reactions and dispersal of the allergens can occur through vacuuming. Repeated exposure to the allergens can lead to a sensitisation thereby increase the risk of adverse respiratory effects, thus it is important that a vacuum machine fitted with a HEPA filter is used to protect the health of the client and the Pest Manager."

**Section 17.1.4** (Heat), Page 36: Subheadings added.

**Section 17.1.4** (Heat), Page 36: Subsection on Thermal Heating added; "Thermal Heating: large electric or gas driven heating units are increasingly being employed for bed bug control around the world. The most efficient are 'bubble treatments', where infested items are treated in a small contained area. Heat treating whole rooms is rarely successful without the use of insecticides as there are many harbourages that can protect the bed bugs, and control is especially difficult in heavily cluttered rooms. Ideally the airspace should be heated first before fans are switched on. Thermal control for bed bugs in large spaces requires a high level of skill; fans are required to distribute hot air evenly, multiple temperature monitoring devices are necessary to record heat changes and to ensure that the appropriate temperatures are reached. There have been a series of fires resulting in the complete destruction of dwellings caused by the inappropriate use of heating units; this method should only be undertaken by trained individuals."

**Section 17.1.5** (Steam), Page 37: Added to fourth paragraph; "However, heat penetration into the surface being treated will not be as great."

**Section 17.1.6** (Cold), Page 39: Added; "Many modern freezers are of the 'frost-free' type and go through cycles of varying temperatures. As a result, bed bugs will require a much longer time in the freezer to be killed, even up to several days."

**Section 17.1.6** (Cold), Page 39: Added; "High pressure devices that employ various gases with the aim to freeze bed bugs are not endorsed within this CoP. This is for their propensity to non-lethally blow bed bugs about, with the potential to spread an infestation, increasing the risk of treatment failure (for a full discussion on this, see [http://medent.usyd.edu.au/bedbug/cop\\_ed4\\_submissions.pdf](http://medent.usyd.edu.au/bedbug/cop_ed4_submissions.pdf))."

**Section 17.1.9** (Bed Bug Traps/Barriers), Page 42: Added; "The use of sticky tapes for the monitoring of bed bugs have been found ineffective (Doggett *et al.* 2011). Bed bugs tend to react negatively to gels and other sticky surfaces, and avoid capture."

**Section 17.1.9** (Bed Bug Traps/Barriers), Page 44: Discussion on BB Secure Ring added.

**Section 17.2.1** (Insecticide Application & Situational Choices), Page 44: Added to the end of the first paragraph; "However, due to the problems of insecticide resistance of bed bugs in the field, registration of a product by the APVMA is not proof of efficacy as the APVMA does not require that efficacy data is provided on modern insecticide resistant bed bug strains."

**Section 17.2.1** (Insecticide Application & Situational Choices), Page 44: Added to fourth paragraph; "Due to insecticide resistance, permethrin dust use should be avoided."

**Section 17.2.1** (Insecticide Application & Situational Choices), Page 45: Added to fifth paragraph; "Despite being effective as topical killing agents, aerosols provide poor residual action against resistant bed bugs, which means that other formulations must be co-employed."

**Section 17.2.2** (Currently Registered Products), Page 46: Amorphous Silica, Chlofenapyr and Propoxur added to table.

**Section 17.2.3** (Insecticide Efficacy), Page 47: Paragraph amended to; "However, the OPs and some carbamates (notably propoxur) have use limitations. They have an unpleasant odour which would be unacceptable to many clients, especially for accommodation providers. The OPs also contain various solvents that can cause staining on some surfaces, notably fabrics, which means that there are restricted use patterns. For example, the label for Actellic (primiphos-methyl) states "Do not apply to carpets, mats or soft furnishings", which means this product can not be used in the eradication of many bed bug infestations. Despite this, there are circumstances when the OPs may be used, for example in premises which remain unoccupied for some time such that the odour can dissipate."

**Section 17.2.3** (Insecticide Efficacy), Page 47: Added; "Currently the only carbamates registered against bed bugs is bendiocarb and propoxur. Propoxur is present in the aerosol Battleaxe Pro..."

**Section 17.2.3** (Insecticide Efficacy), Page 48: Second last paragraph added;

"In 2010, Phantom SC Insecticide was registered in the Australia for the control of bed bugs. Published efficacy data have demonstrated variable results; while two laboratory investigations have found that the product would slowly kill all bed bugs exposed, another found the product so ineffective that the treated bed bugs mated and laid eggs, with many of the hatching nymphs surviving. A third laboratory trial, from Australia, found that the product was unable to kill any bed bug strain, even those susceptible to the pyrethroids (Doggett *et al.* 2011). Two field investigations have also demonstrated poor efficacy; in one of the trials complete control was not achieved over five months despite repeated applications with the product (Doggett *et al.* 2012). In light of the generally variable published efficacy results, the use of Phantom SC Insecticide against bed bugs is not supported."

**Section 17.2.4** (Insecticide Reapplication), Page 49: Paragraph amended to; "...Many products also provide poor residual control and thus may not kill newly emerged nymphs. To facilitate the kill of newly emerged nymphs, additional direct application treatments must be undertaken after the eggs have hatched. The duration of egg hatching, and thus the time to the additional treatments, will be dependent on the ambient temperature (Table 2) and at least one follow up visit must be made with an insecticidal application."

**Section 17.2.5** (Insecticide Resistance Strategies), Page 49: Added to last paragraph; "Recent studies have also identified resistance to the OPs."

**Section 19.1.1** (Measurement of Success), Page 50: Added to end of first paragraph; "All adjoining rooms must be inspected; an infestation in these rooms may indicate a control failure."

**Section 19.1.2** (Eradication Declaration), Page 50: New Section.

**Section 20** (REDUCING BED BUG RISKS), Page 50: Section title changed from 'PREVENTION MEASURES', as bed bugs can not be prevented, but risk measures can be implemented to reduce the possibility of an infestation, or an infestation becoming out of control.

**Section 20.1** (Bed Bug Population Dynamics), Page 51: Added to first paragraph, third sentence; "It should be noted that this is a general path; bed bugs could spread soon after introduction even though the population has yet to substantially grow."

**Section 20.2** (Bed Bug Management Policy), Page 52: Added to first paragraph; "A Proactive Bed Bug Management Plan should be prepared in the event of an infestation (Section 16.1)."

**Section 20.4** (Second Hand Furniture), Page 55: Added to the end of the first

paragraph; "No item should be transferred from a previously infested room."

**Section 20.9** (Mattress Design, Encasement and Treatment), Page 57: Paragraph changed to; "Presently there are mattresses and mattress covers available pre-treated with insecticides and claiming to resist bed bug infestations. Laboratory tests evaluating permethrin impregnated fabrics against a resistant Australian bed bug strain have found these fabrics ineffectual (Doggett et al. 2011). The use of these products may even contribute to the development of further insecticide resistance (Davis et al. 2012). Until the Working Party has sighted data supporting efficacy of treated mattresses against modern insecticide resistant Australian bed bug strains, such mattresses are not recommended within the CoP."

**Section 22** (Definitions), Page 65: Definition for 'Best Practice' and 'PestCPD' added.

**Section 23** (References and Further Reading) Page 67: References added;

1. Davies TGE, Field LM and Williamson MS. 2012. **The re-emergence of the bed bug as a nuisance pest: implications of resistance to the pyrethroid insecticides.** *Medical and Veterinary Entomology*, 26:241-254.
2. Doggett S.L., Orton C.J., Lilly D.G. and Russell R.C. 2011. *Bed bugs - a growing problem worldwide. Australian and international trends update and causes for concern. Australian Environmental Pest Managers Association, NSW Conference 2011. Session 2A, 2nd June 2011, Bicentennial Park, Homebush Bay, Sydney.* 24pp. Available from: [http://medent.usyd.edu.au/bedbug/papers/aepma\\_2011\\_doggett.pdf](http://medent.usyd.edu.au/bedbug/papers/aepma_2011_doggett.pdf)
3. Doggett SL, Dwyer DE, Peñas PF and Russell RC. 2012. **Bed bugs: clinical relevance and control options.** *Clinical Microbiological Reviews*, 25(1): 164-192.
4. Jones SC and Bryant JL. 2012. **Ineffectiveness of over-the-counter total-release foggers against the bed bug (Hemiptera: Cimicidae).** *Journal of Economic Entomology*, 105: 957-963.
5. NPMA. 2011. **Bed bugs best management practices.** *The National Pest Management Association of American.* Available online: [http://www.npmapestworld.org/publicpolicy/documents/NPMABedBugBMPAPPROVED20110124\\_prettified.pdf](http://www.npmapestworld.org/publicpolicy/documents/NPMABedBugBMPAPPROVED20110124_prettified.pdf)
6. Madge, O. European Code of Practice, Bed Bug Management; Bed Bug Foundation: London, UK, 2011; p. 36. Available online: [www.bedbugfoundation.org/](http://www.bedbugfoundation.org/)

**Section 24** (Acknowledgements), Page 69: updated.

**Former Section 25** (Potential New Insecticides): Entire Section deleted.

**Section 25** (The CoP Working Party), Page 70: Associate Members listed.

**Section 26.1** (Mattress Encasements), Page 71: Mattress Safe encasements supplier details changed.

**Section 26.2** (Miscellaneous), Page 71: Subheading changed, supplier detailed moved from 26.1.

**Section 28** (Bed Bug Service Checklist), Page 73: Under 'Information to Client', fourth dot point modified to; "Bed Bug Management Plan and billing details provided (the Plan includes the schedule of treatment)."

**Section 28** (Bed Bug Service Checklist), Page 75: Added next to 'Inspection Notes'; "*include impediments to completing the inspection*".

**Section 29** (Registered Pesticides), Page 79: Unregistered products removed, newly registered products added. On page 79, for emphasis the following is now bold and the 'not' underlined; "**i.e. registration by the APVMA is not proof of efficacy**". On page 90, "Not Stated" under 'Approved Use', is now defined.