

Bed Bugs Action Plan for Migrant Worker Housing

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Communal living facilities are always at risk for bed bugs. Summer camps, youth hostels, women's shelters and day care centers all bring diverse people and their belongings together into close quarters, often under the same roof. Migrant labor camps are another example of people coming from different locations to live together for a short period of time and then moving on to another communal living situation in another location. If any of these workers were living with bed bugs prior to arriving at the new facility, they may very well be transporting bed bugs with them in their personal belongings.



Because migrant labor living quarters are often dormitory style, or have multiple sleeping rooms connected by common walls, bed bugs have free access to move from one bed to another within the facilities. This freedom of movement allows them to feed on multiple hosts, and to potentially infest everyone's belongings. Easy access to food (people) and harborage (hiding places) allows a few bed bugs in a manageable situation to develop into a raging infestation. To prevent an infestation from getting out of hand, it is very important that the facility personnel, and even the workers themselves, become very familiar with identifying bed bug evidence so that small populations can be detected early.



Agricultural migrant worker facilities typically have the advantage of being empty for at least part of the year. So even if the building does become infested with bed bugs, the populations can be dealt with effectively after the workers have left at the end of the season. If a particular building has been treated for bed bugs during the previous season, it would be wise to have a bed bug detection dog inspect the building prior to the new workers arrival. Canine inspection will prevent new workers from moving into a building with "leftover" bed bugs inside it.

Arrival and Transportation Issues

In the past, migrant workers were typically moved as a group from one production area to another using buses or vans. Their belongings were packed into those vehicles and moved along with them. Today, migrant workers often have their own cars and drive themselves from one job site to another. Both communal transportation and the use of personal vehicles can contribute to bed bug infestations, but in different ways. Communal transportation allows bed bugs in one person's belongings to move into another's during the transportation process. In addition, as we have already seen in some labor camps, the transport vehicle itself can become infested. The end result is that more people are carrying bed bugs off the bus than carried them on.

Workers using their own vehicles may not spread their bed bugs as easily. However, the vehicle itself may serve as a long-term bed bug harborage. Bed bugs may be hiding in personal articles that the worker is storing in the car. The vehicle owner may later bring these items (and the bed bugs) into the sleeping facility. Many people believe that bed bugs will die if they sit in a hot car all day. However, as more and more infested vehicles in the United States are being fumigated, we realize that most automobiles do not get hot enough to kill all of the bed bugs. Some bed bugs find insulated hiding places among stored items in the car. Also, many geographic locations may not be hot enough during the year to kill bed bugs (thermal death point is 122°F).



Before Workers Arrive (Bed Bug Prevention)

Below is a check list for what needs to be done prior to migrant worker arrival as part of a complete bed bug management program. Each item will be explained in detail below.

- 1. Inspection of all sleeping and dining facilities prior to worker arrival. Use an experienced bed bug management professional or a trained bed bug canine (highly recommended).**
- 2. Bed bug identification and management training for employee supervisors and facilities management personnel.**
- 3. Implementation of bed bug prevention methods (heat chamber, dedicated clothes dryer, and diatomaceous earth application).**
- 4. Discussion and establishment of bed bug treatment protocols (for sleeping rooms, vehicles, community rooms, laundry facilities, etc.) with a trained bed bug management professional.**
- 5. Obtainment of Spanish language bed bug literature and /or videos for distribution at the worker orientation program.**
- 6. Development of bed bug reporting procedures for workers.**



1. Building Inspection

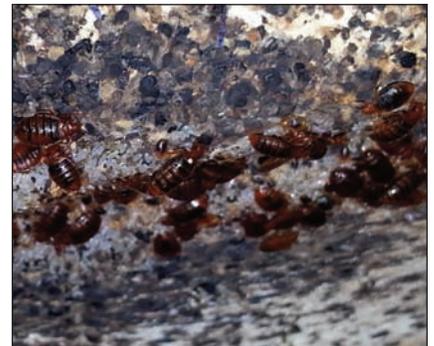
The best time to have all of the camp buildings inspected for bed bugs is after the workers move out at the end of the season. Mattresses will be bare and the rooms will be free of all personal belongings, making inspections much easier. Bed bug inspection is a slow tedious process where inspectors are not only looking for live bed bugs (and eggs) but also for bed bug evidence (cast skins and fecal spots). Two trained bed bug inspectors should inspect each building so that more eyes are searching for bed bug evidence. Different buildings should also be inspected over multiple days in large camps so that inspectors do not get fatigued and lose their attention to detail.

Canine bed bug detection is the preferred method of inspection because a well-trained dog team (dog and handler) can inspect more buildings in much less time than human inspectors alone. Bed bug dogs use their nose (olfactory sense) to locate live bed bugs, while humans have to rely on visually inspecting every mattress seam and baseboard crack to locate bed bugs hiding in these micro-habitats. A housing facility that might take two trained humans 2-3 hours to inspect would take a trained dog a matter of minutes. However, keep in mind that not all dogs (or their human handlers) are created equal. So it is important to hire a bed bug dog team that has been NESDECA (National Entomology Scent Detection Canine Association) certified. This certification indicates that the team (not just the dog) has had a high quality of training and has successfully passed a rigorous bed bug detection examination.

2. Bed Bug Training for Facilities Personnel

Because of the great potential for bed bugs to arrive with the labor force, it is very important that everyone (facilities personnel, labor supervisors and the workers themselves) be able to identify bed bugs on sight. In addition, they must be well educated regarding what to do if bed bugs are detected.

Facilities personnel, labor managers and work site supervisors should contact their local county Extension office to see if bed bug education training can be provided prior to the work force arrival. The facilities personnel should learn as much as possible about bed bug behavior and identification prior to any bed bugs entering the facility. The facilities personnel also must take time to learn about different bed bug treatment methods. This will enable them to better select a knowledgeable pest management company and to determine which treatments would be the most effective, and/or desirable for use in their facilities. The extension agent may also provide a supply of printed flyers and bed bug literature for distribution to workers at camp orientation.



3. Bed Bug Prevention

If bed bugs are found during the inspection, or the facility has had bed bugs in previous seasons, it is well worth the effort to put a bed bug prevention program in place. While this program will not stop bed bugs from being brought in, if implemented properly, a prevention program will limit bed bug spread from one location to another.

Desiccant Dust. The first component of the prevention program is an application of a pesticide grade desiccant dust like Mother Earth D (EPA registration number 499-509) or CimeXa (EPA registration number 73079-12). Mother Earth D is a diatomaceous earth (DE) product. DE is a desiccant dust made of the silica-based skeletons of microorganisms called diatoms. This dust kills bed bugs by sticking to the outside of their bodies, absorbing their protective wax layer and causing them to lose their body moisture. The bed bugs desiccate and die within a couple of days. CimeXa is a silicon dioxide product that works very similarly to DE. CimeXa clings to the bed bug wax layer when they walk through it, dehydrating and killing them within a couple of days. Both products are non-toxic (they are not chemical insecticides), they are very safe to use and have broad labels allowing them to be applied in many locations where insecticidal dusts cannot (bed frames, rugs, upholstered furniture etc.).



Using a professional power duster, a very light dusting of Mother Earth D or CimeXa can be placed behind baseboards, along carpet tacking, behind electrical faceplates, in vents, in drop ceilings, wall voids or other locations that bed bugs might use to travel from one sleeping unit to another. Many migrant worker housing facilities can be quite old (20-50 years) so cracks, settling or even remodeling of the structure may have occurred over time, creating voids and other spaces that bed bugs could use to travel between units within the same building. Therefore, being aware of the unique aspects of the building construction will go a long way in helping the facilities manager to decide where the dust should be applied. Bed bugs cannot travel through poured concrete walls or cinder block. Yet if the cinderblock building has a drop ceiling, bed bugs can use that ceiling to travel to other locations within the building. Scrutinize the building construction and ask yourself, are there electrical or plumbing penetrations that might give bed bug access through the walls to other locations? Is it a wood frame building that might allow bed bugs to travel through wall voids? Can bed bugs get behind the baseboards? The key to preventing bed bug spread is to think like a bed bug. Ask yourself how you might travel from one room to another through the structure. Every possible travel route can be treated with a fine layer of desiccant dust, forcing the bed bugs to crawl through a lethal dose of the dust as they move along.



Heat Chamber. Bed bugs are an incredibly difficult pest to control because they are so good at hiding in people's belongings. Also, modern bed bug populations are highly resistant to insecticides. However, heat is known to be a very effective bed bug killer. Having a portable heat chamber on site is an excellent way for workers to treat bed bug infested belongings before bringing them into the living facility. If a worker is found to have brought bed bugs into the camp, their belongings can be moved directly into the heat chamber and treated prior to exposing other workers. Also, if some workers fear that their belongings have been compromised in the transport vehicle, they can also have their belongings treated with heat. Small portable heat chambers can be used to kill bed bugs in infested household items (books, shoes, lamps, toys). Larger heat chambers can be used to treat furniture and electronics (televisions, computers, etc.) Heat treatment offers certain advantages when it comes to bed bug management. First, bed bugs are not resistant to heat. Second, heat is non-toxic, yet can kill all bed bug life stages including bed bug eggs.





Do-it Yourself Heat Chamber. At the University of Florida, Drs. Philip Koehler and Roberto Pereira developed a protocol for building a heat chamber (8' x 8') made of Polystyrene foam that could be used to treat household items and furniture for bed bugs. The chamber can be set up in any space large enough to house it. Rooms with wood or tile floors require some extra preparation by placing an insulating foam mat under the chamber. This heat chamber is easily put together, taken down, and re-used in different locations. The heat chamber is also economical in that all components can be purchased for ~ \$500.

A 30 min instructional video is available at the website below and contains some valuable tips regarding chamber construction.

(http://entnemdept.ifas.ufl.edu/sepmc/bedbug_heat_treatment/Bed_Bug_Heat_Treatment.html). For heat chamber components see Fact Sheet: Using Heat to Kill Bed Bugs

Two very important points need to be made regarding the use of this heat chamber:

- 1. The thermal death point for adult bed bugs and their eggs is 122°F.***
- 2. Therefore successful heat treatment in the chamber is not dependent on the length of the treatment (time), but on all items in the chamber reaching the lethal temperature (122°F). Treatment usually takes several hours to complete.***

Dedicated Clothes Dryer: Having a dedicated “bed bug” clothes dryer set in an isolated location is an excellent way of preventing the laundry facility from becoming infested. Infested clothing does not have to be washed, only heated to the lethal temperature in the dryer. Many small items like stuffed toys, clothes or shoes cannot be treated with insecticides. So a household dryer is excellent for killing bed bugs on these items. A loosely filled dryer set on “high” is capable of killing all bed bug life-stages and their eggs in about 30 minutes. A dryer with a removable shelf is excellent for killing bed bugs on belongings that cannot be tumbled, like leather shoes, handbags, knick-knacks and even books. However, the drying time may need to increase to assure that all items reach the bed bugs’ thermal death point.



4. Treatment Protocols for Future Infestations

After receiving their bed bug training, facilities managers, and work supervisors should discuss those treatment methods that would be acceptable for use in their facilities. This way, when a bed bug problem does arise no one is left guessing what to do and possibly making costly mistakes. While a spray insecticide application for a small infestation may be the most economical option, it is well known that today’s bed bugs are highly resistant to insecticides. Most insecticides will kill adults and nymphs if the bugs are sprayed directly, but very few will kill eggs. Also, once the insecticides are dry, they rarely kill bed bugs of any stage. In a cluttered dormitory, getting a quality spray application of insecticide may also be very difficult. Therefore, relying on insecticidal treatment alone may not produce the desired result.

For sleeping areas whole-room heat treatment may be a more effective bed bug management strategy. These treatments usually require less preparation than chemical treatments and have the advantage of treating household items (items that cannot be chemically treated) in addition to cracks, crevices and furniture. However, depending on the building construction, there may be “cold-spots” that do not get up to the bed bug thermal death point (122°F).

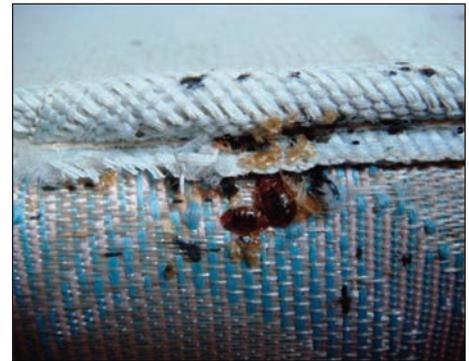
It is important to monitor the heat treatment, and the temperatures of items inside the heated building to make sure that the bed bugs have no refuge. Consider also that in a cluttered environment, certain items like stacks of magazines or bags of clothing will never get to a lethal temperature. This will result in treatment failures and having to treat the same location multiple times. Repeated failure to get rid of the bed bugs will frustrate the workers suffering from bed bug bites. It is very important that a heat treatment be applied correctly and that the temperatures are monitored in several locations during the process.



There are many variables to consider when designing bed bug treatment protocols. One size does not fit all, and a different protocol will need to be used in a housing facility than in a laundry facility or a transport vehicle. The variables to consider in each case are: the size of the infestation, potential hazard to the residents, the square footage of the area that is infested, the number of pieces of potentially infested furniture, the level of clutter and the cost and difficulty of treatment. The best treatment protocols employ both chemical and non-chemical control measures with the non-chemical making up the bulk of the treatment.

To make intelligent and effective choices regarding bed bug management, facilities personnel must be knowledgeable about bed bug biology and behavior. Otherwise, ineffective and costly decisions will be made.

For example, one migrant housing facility found bed bugs in the workers' mattresses. So they decided to burn all the mattresses in the facility (note that bed bugs do not only infest mattresses) and ordered replacement mattresses from their headquarters. The replacement mattresses arrived and were immediately found to be infested with bed bugs also. This turned out to be a very expensive mistake. A more knowledgeable approach would have been to purchase encasements for the mattresses and treat the infested building(s) with heat. While mattress encasements do not prevent or remediate bed bugs, they do trap bed bugs inside the bite-proof, escape-proof, encasement and protect the mattress from future infestations. Encasements would have saved the mattresses, allowing the building infestation to be addressed.



To learn more about bed bug treatments, see additional fact sheets describing bed bug management tools available at <http://www.vdacs.virginia.gov/pesticides/bedbugs-facts.shtml>. The topics include "Using Insecticides," "Killing Bed Bugs with Heat," "Bed Bug Prevention," "Non-Chemical Bed Bug Management" and "Bed Bug Treatment: What to Expect" (from your pest control company). These fact sheets will familiarize you with the advantages and disadvantages of each bed bug treatment method.

5. Worker Orientation at Move In

Bed bugs should be discussed at worker orientation and an illustrated fact sheet showing photographs of bed bug evidence should be provided to each worker. All printed information must be available in both English and Spanish (68% of all workers in Virginia were born in Mexico and 38% speak no English at all). However, keep in mind that 57% of workers have a 9th grade education or less. Their ability to read, even their native language, may not be advanced enough to fully comprehend the printed literature. Therefore, it is very important that videos also be made available so that workers can easily learn to identify bed bugs and know exactly what to do (and not to do) if they find bed bug evidence.

6. Bed Bug Reporting Procedure

Tell everyone in the facility exactly what to do if they find a bed bug. It is often the case that one worker may have bed bugs but another actually finds them. The latter person may be reluctant to report the problem for fear of getting into conflict with either the management or their roommate. Alternatively, the worker may realize that they have bed bugs themselves and do not want to report them. Workers should be provided with a simple and (if need be) anonymous method of reporting a bed bug problem. This way, management can identify the location without accusing anyone of being responsible. Emphasize that it is much more important to have bed bugs reported early so that they do not spread, than it is to identify who brought in the bed bugs.