Beating Back Bed Bugs
Materials and Resources Binder

This packet contains guidelines, fact sheets, and protocols to help you better avoid and control bed bug infestation in your building or home.

Compiled and Designed by:

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# Beating Back Bed Bugs
## Materials & Resource Binder

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BIOLOGY
Understanding how bed bugs eat and live can help you get rid of them.

- Adult bed bugs are flat, small (less than ¼ inch long), oval-shaped, wingless, and reddish brown. Immature bugs are smaller and amber colored. Eggs are tiny and white.

- They feed on blood and attach themselves to their favorite meal: humans and animals. Bed bugs need blood to grow and can live up to one year on a single feeding.

- Bed bugs usually bite at night, while we are sleeping.

- Bed bugs move around by hitching rides on clothing, furniture, bedding, and baggage. Bed bugs will live in any crack or crevice in or around your sleeping areas.

HEALTH ISSUES

- Not known disease carriers.

- Bites can cause an allergic reaction with swelling, redness, and itching.

- Skin infection and scarring can result from scratching.

- The majority of people do not react to bed bug bites.

- Lack of sleep is a serious side-effect causing reduced alertness, loss of productivity, and mood problems.

PREVENTION

Bed bugs are hard to prevent because of their small size, night habits, and ability to hitchhike. Here are some tips to get you started:

- Be on the look out for signs of infestations such as: waking up with bites; seeing live bugs; or dark red or black spots on bedding, carpets, walls and furniture. Finding bed bugs early is the key to preventing their spread.

- Paint and caulk around sleeping areas – such as along baseboards, windows and bed frames – to seal hiding spots.

- Inspect used furniture closely before bringing into your home. Look for signs of infestations in cushions, zippers, seams, and underneath including springs and frames. Use a magnifying glass if possible. Beware of items in alleys and dumpsters.

- Take a look around mattresses and furniture when staying in an unfamiliar place. Bed bugs can hitch a ride home on your clothing or luggage.
Be persistent!! Getting rid of bed bugs will require many different steps over several weeks. Be patient and persistent, and you will succeed.

- **Find out where they are hiding.** Bed bugs don’t just stay in mattresses (though that is a favorite hiding spot). Look along baseboards, under and behind dressers, and any other dark hidden areas nearby. Monitoring devices, like glue boards or special bed bug detectors, may be helpful with locating bed bugs.

- **Vacuum infested areas carefully.** This will quickly knock down numbers of live bugs. **Remove vacuum bag or contents,** place into a plastic bag, seal tightly, and dispose right away. Vacuuming alone will not eliminate an infestation.

- **Steam clean furniture** and other surfaces to kill remaining bugs and hidden eggs. Handheld steamers are widely available in stores and online. The steaming time depends on the steam temperature, i.e., the higher the temperature the faster the kill. Pass the steamer slowly over infested surfaces. Always use caution to avoid burns.

- **Put mattress and box spring into a bed bug proof cover.** These covers are tear resistant and have a tight locking zipper that keeps bed bugs from escaping. Leave cover on for at least one year and pull bed away from the wall. Keep bedding from touching the floor and change sheets often until the problem is eliminated.

- **Wash all linen, laundry, and other infested clothing articles in hot water.** Dry on the highest possible setting. Unwashed, unwashable, and “dry clean only” items can be put in the drier for at least 20 minutes to kill bed bugs.

- You do not have to throw away furniture, including mattresses. Most items can be treated. **Talk to your pest control professional before throwing anything out.**

- Infested items left in common areas such as alleys, basements and curbs may spread the problem to others in your community. **Mark or label any items that you are throwing out** to prevent others from accidentally bringing bed bugs home.

- **Do not use chemicals around sleeping areas** and furniture unless they are properly labeled to treat these surfaces for bed bugs.

- If you are renting, **notify your landlord about any sign of bed bug immediately.** You have the right to live in safe and decent housing. Work with your landlord to get problems corrected quickly and prevent the spread of bed bugs.

Remember, there is no magic formula that will guarantee bed bug elimination. These tips are not intended to replace a select treatment program by knowledgeable professionals. The use of pesticides may be necessary. If possible, seek professional advice before applying pesticides for bed bugs especially around people with health conditions.

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**REFERENCES**


LA BIOLOGÍA

Puede deshacerse de los chinches entendiendo cómo ellos viven y comen.

- Los chinches adultos son chatos y pequeños (menos de ¼ de pulgada de longitud), no tienen alas, son de forma oval y color marrón rojizo. Los chinches jóvenes son más pequeños y de color ambar. Los huevos son minúsculos y blancos.
- Se alimentan de sangre y se pegan a sus huéspedes preferidos: los humanos. Los chinches necesitan sangre para crecer y pueden vivir hasta un año después de una sola ingestión.
- En general, los chinches pican por la noche mientras dormimos.
- Los chinches se transportan pegándose en la ropa, en los muebles y en el equipaje. Durante el día, se esconden en las grietas del piso, dentro de los colchones, en el marco de las camas así como en la cabecera y en las costuras de los sofás.

PROBLEMAS DE SALUD

Aunque al chinche no se le conoce como portador de enfermedades, la reacción del cuerpo a una picadura de chinche puede producir una reacción alérgica y malestar. La picadura de un chinche suele ser pequeña, rojiza y causar comezón. Rascarse de manera continua una picadura puede provocar infecciones y cicatrices en la piel. Pero, no toda la gente muestran reacciones a las picaduras. Es posible que tengan chinches aunque no tengan ninguna marca de picadura.

LA PREVENCIÓN

Es difícil evitar la presencia de los chinches debido a su pequeño tamaño y la forma de transportarse. Para comenzar, se indican a continuación algunos consejos prácticos:

- **Esté pendiente** de detectar señales de infestación tales como despertar con picaduras, ver chinches vivos o puntos de color rojo oscuro o negro en la ropa de cama, las alfombras, las paredes y los muebles. La detección temprana de los chinches es la clave para evitar que se propaguen.
- **Pinte o enmasille la zona cerca de las áreas para dormir** – como por ejemplo a lo largo de la cabecera, las ventanas y el marco de las camas – para sellar los escondites.
- **Examine a fondo los muebles usados** antes de llevarlos a casa. Revise los cójines, las cremalleras, las costuras y debajo de los muebles incluso los resortes y marcos para buscar alguna evidencia de infestación. Si es posible utilice una lupa. Tenga cuidado con los artículos desechados en los callejones y los basureros.
- **Inspeccione los colchones y los muebles** cuando esté de visita en lugares desconocidos. Los chinches pueden transportarse sobre su ropa maletas y corren el riesgo de de traerlos a casa con ustedes.
**LOS CHINCHES (SIGUE)**

**EL CONTROL**

Insista! Una vez que los chinches hayan entrado en su casa, lo mejor que puede hacer es ser persistente. Este problema requerirá numerosas medidas distintas durante varias semanas pero con paciencia usted puede lograrlo.

- **Averigüe donde se esconden.** Los chinches no se encuentran sólo en los colchones (aunque éstos son sus escondites preferidos). Revise a lo largo de los zócalos, debajo y detrás de la cómoda y en otras partes cercanas que estén escondidas y a oscuras.

- **Pase cuidadosamente la aspiradora en las zonas infestadas.** Esto eliminará rápidamente gran cantidad de chinches vivos. **Saque el contenido o la bolsa de la aspiradora,** colóquela en una bolsa de plástico, séllela bien y deséchela inmediatamente.

- **Limpie los muebles con un limpiador de vapor para matar los chinches y los huevos que queden.** Ahora los limpiadores de vapor portátiles son fácil de conseguir y limpiarán muy bien tanto los muebles como los colchones. Los chinches son vulnerables cuando expuestos a temperaturas de más de 97°F. Las temperaturas de vapor deben ser más de 120°F para crear el mayor impacto. Lentamente pase el limpiador a vapor sobre las superficies infestadas. Siempre debe tener cuidado con estas altas temperaturas.

- **Cubra el colchón y la base con un forro que proteja contra los chinches.** Estos forros son resistentes a roturas y tienen una cremallera ajustada que sella bien, lo cual evita que se escapan los chinches. Deje los forros puestos por lo menos durante un año y retire la cama de la pared. Impida que la ropa de cama toque el piso y cambie las sabanas con frecuencia hasta que el problema se elimine.

- **Lave en agua caliente toda la ropa blanca, la ropa sucia y cualquier otro artículo infestado.** Luego seque la ropa en la secadora a la temperatura máxima. Si no pueden lavar todo, el secarlo durante, por lo menos, 15 minutos matará los bichos. También pueden meter los artículos de “limpieza en seco solamente” en la secadora siempre y cuando no estén mojados.

- **No tiene que desechar los muebles ni los colchones.** La mayoría de artículos se pueden tratar. **Hable con su agente profesional de control de plagas antes de desechar algo.**

- **Los artículos infestados dejados en áreas comunes tales como callejones, sótanos y bordillos pueden propagar el problema a otros en la comunidad.** **Marque o ponga etiquetas en cualquier artículo que desche** para evitar que otras personas sin querer se lleven a casa los chinches.

- **Si usted está en alquiler, informe enseguida al dueño de la casa de cualquier evidencia de chinches.** Usted tiene el derecho de vivir en un entorno adecuado y seguro. Colabore con el dueño de su casa para resolver rápidamente los problemas y evitar la propagación de los chinches.

Estos consejos prácticos deben de usarse en adición al uso limitado de los pesticidas, y no se debe de pretender remplazar un programa tratamiento de profesionales especialistas. No use químicos alrededor de los muebles y lugares donde se duerme al menos que estén adecuadamente etiquetados para tratar los chinches en el hogar. Siempre pida consejo profesional antes de aplicar pesticidas alrededor de personas con condiciones de salud.

**REFERENCIAS**


Early inspection and intervention is the key to keeping bed bug problems manageable and affordable. Eliminating bed bugs demands cooperation between the tenant(s), pest control company, and building management. Skipping labor-intensive strategies to save money in the short term will likely result in even bigger problems, and cost you more in the long run. Pesticides alone WILL RARELY solve the problem due to bed bug resistance. Improper application of pesticides can even cause bed bugs to spread to other building areas.

Here is a checklist of strategies for preventing, eliminating and containing the spread of bed bug infestations. There is no “magic form” for eliminating bed bug problems - the process will take time and require patience. This is only a suggested checklist since every building is different. Hiring a pest control operator with bed bug elimination experience is recommended (see guidelines Provided). If hired, always follow the pest control operator’s advice.

BE PROACTIVE

- Use good building practices and maintenance to prevent pest problems.
  - Caulk baseboards, loose tiles, and chair-rail moldings
  - Remove carpeting when possible
  - Fix storage and clutter issues in common areas

- Develop a “bed bug action plan” for your building(s).
  Include strategies for:
  - Responding to reports or complaints
  - Containing and eliminating infestations
  - Disposing of infested furniture
  - Educating and advising tenants
  - Managing requests for relocation

- Educate tenants and staff about bed bugs before they become a problem.
  Provide information on:
  - The reappearance of bed bugs as a problem around the world
  - What bed bugs are and what they look like
  - How to recognize a bed bug problem
  - How to prevent bed bugs from becoming a problem (i.e., discourage use of “alley” mattresses or furniture; reduce clutter)
  - What to do when a bed bug problem is suspected

- If bed bugs are a recurring problem, consider having periodic inspections, buying a steam cleaner (steam heated to at least 170°F) and training staff to operate it, or making serious repairs to building (i.e., replacing carpeted flooring with a hard-surface flooring).
RESPONDING TO A COMPLAINT

- Respond sympathetically and avoid blame
- Arrange for a professional inspection
  - Inspect all adjacent apartments (above, below, and on both sides) of the likely infested unit
  - Schedule an intervention for all apartments where bed bugs are found
- Educate tenants on what they can, and should, do NOW
  - Give them a tenant checklist or bed bug factsheet
  - Explain how to prepare for the pest control company’s inspection
  - Discourage them from throwing away belongings and/or furniture, OR explain to them how to do so properly

ONCE AN INFESTATION IS CONFIRMED

- Educate tenants on how to prepare for treatment
- Educate staff on their role
- Prevent the spread of an infestation by doing the following:
  - Inspect all adjacent apartments above, below, and on both sides on a regular basis
  - Consider buying or encouraging tenants in adjacent units to buy bed bug resistant mattress covers
  - Encourage tenants in adjacent units to be aware and report signs or symptoms of bed bugs immediately
  - Seal and make repairs to infested and adjacent apartments
    - Caulk or seal cracks and crevices near beds such as those along baseboards, around pipe chases, or around heating and AC units
    - Repair holes and other damage in walls
    - Repair molding, peeling wall paper; chipping paint; and any other damage that may provide hiding places for bed bugs
    - Develop a system for furniture disposal
    - Paint or seal hardwood floors and encourage tenants to do the same to bed frames

HIRING A PEST CONTROL COMPANY: DON’T THROW YOUR MONEY AWAY

To successfully eliminate bed bugs, we recommend hiring a company experienced in the Integrated Pest Management (IPM) approach to bed bug control. Do not hire a company based on price alone. Make sure the company is qualified to do the job right the first time and avoid more headaches later. Here are some tips on how to choose a pest control company for bed bug work:

- Make sure they are licensed and insured
- Ask for and check references for bed bug work
- Insist on an Integrated Pest Management approach – no “spray and pray” pesticide applications
- Have them provide a detailed action plan that recommends pre-treatment preparation activities (Use SPCP factsheet “How to Hire a Pest Professional for Bed Bugs” for help)
- Beware of the lowest bidder
- Beware of any “guarantees”
La inspección y la intervención tempranas son los factores clave para que la solución al problema de los chinches se pueda alcanzar y sea asequible. Para eliminar los chinches es necesaria la cooperación entre el inquilino o los inquilinos, la compañía de control de plagas y los encargados del edificio. Evitar las estrategias que requieren un elevado uso de mano de obra para ahorrar dinero a corto plazo probablemente causará problemas aún mayores y le costará mucho más dinero a largo plazo. Los pesticidas por sí solos RARA VEZ solucionan el problema, debido a la resistencia de los chinches. La aplicación equivocada de los pesticidas hasta puede ocasionar la propagación de los chinches a otras zonas del edificio.

A continuación se indica una lista de comprobación de las estrategias para prevenir, eliminar y contener la propagación de los chinches. No existe una “solución mágica” para eliminar el problema de los chinches – el proceso tomará tiempo y requerirá paciencia. Esta lista de comprobación se ofrece sólo como sugerencia ya que todos los edificios son distintos. Se aconseja contratar a un agente de control de plagas que tenga experiencia en la eliminación de chinches (véase las pautas a continuación). Si lo contrata, siga siempre los consejos del agente de control de plagas.

***SEA PROACTIVO***

☐ Aplique buenas prácticas de mantenimiento del edificio para evitar una infestación de plagas.
  ● Enmasille los zócalos, las losas flojas, las guardasillas
  ● Retire las alfombras
  ● Aborde los problemas de almacenamiento y desorden en los sitios comunes

☐ Desarrolle un “plan de acción contra los chinches” para su(s) edificio(s). Aliste estrategias para:
  ● Contestar a informes o quejas
  ● Contener/eliminar las infestaciones
  ● Deshacerse de los muebles que están contaminados
  ● Educar y aconsejar a los inquilinos
  ● Encargarse de peticiones de mudanza

☐ Notifique y eduche a los inquilinos y empleados sobre los chinches antes de que sean un problema. Explique:
  ● Qué son los chinches
  ● Qué aspecto tienen
  ● Cuáles son las señales de que existe una infestación de chinches
  ● Cómo evitar que los chinches se conviertan en un problema (es decir, desanimar la recogida de colchones o muebles de los callejones)
  ● Qué hacer si sospecha que existe una infestación de chinches

☐ Si la infestación de chinches es un problema recurrente, realice inspecciones periódicas, compre un limpiador de vapor (calentado a una temperatura de por lo menos 170°F) y capacite a sus empleados para que lo manejen, o haga reparaciones profundas en el edificio (es decir, sustituya las alfombras con un piso de madera noble).
RESPONDER A UNA QUEJA

- Conteste con sensibilidad y evite echar la culpa
- Encárguese de que se realice una inspección profesional
  - Revise todos los apartamentos adyacentes a la unidad que probablemente está contaminada (arriba, abajo y a los dos lados)
  - Programe una intervención para todos los apartamentos donde se han encontrado los chinches
- Eduque a los inquilinos sobre lo que pueden y deben hacer ENSEGUIDA:
  - Entréguele una lista de comprobación para los inquilinos
  - Explíqueles cómo se pueden preparar para la inspección
  - Exhórteles a no botar sus pertenencias y/o muebles
    - Si insisten, explíqueles cómo se hace correctamente

UNA VEZ QUE SE HA VERIFICADO LA EXISTENCIA DE UNA INFESTACIÓN

- Explique a los inquilinos cómo prepararse para la aplicación
- Haga que sus empleados sepan el papel que desempeñan
- Implemente un sistema de control
- Evite la propagación de la infestación haciendo lo siguiente:
  - Revise regularmente cada apartamento adyacente, arriba, abajo y a los dos lados
  - Compre forros para los colchones o alentar a los inquilinos de los apartamentos adyacentes a comprarlos
  - Anime a los inquilinos que viven en las unidades adyacentes a estar pendientes y a comunicar inmediatamente cualquier indicación o síntoma de la presencia de chinches
  - Selle y haga reparaciones en los apartamentos adyacentes y contaminados
    - Enmasille o selle las grietas y hendiduras que estén cerca de las camas, tales como las que ocurren en los zócalos, alrededor de los tubos o alrededor del calefactor y el acondicionador de aire
    - Arregle los huecos y cualquier otro daño en las paredes
    - Repare la moldura, el papel tapiz, la pintura desmenuzada y todos los daños que puedan servir de escondite para los chinches
    - Elabore un sistema que se pueda utilizar para deshacerse de los muebles
    - Pinte o selle los bastidores y los pisos de madera noble

CONTRATACIÓN DE UNA COMPAÑÍA DE CONTROL DE PLAGAS: NO DESPERDICIE SU DINERO

Para eliminar satisfactoriamente los chinches, le aconsejamos que contrate a una compañía con experiencia en el control de los chinches que utilice el Control Integrado de Plagas (CIP) para la eliminación de los mismos. No se base sólo en el precio. En general, las compañías que ofrecen precios muy bajos no están preparadas o son incapaces de hacer un trabajo completo y a largo plazo le costará más dinero y le ocasionará muchos dolores de cabeza. A continuación se indican algunos consejos sobre cómo escoger una compañía de control de plagas para eliminar los chinches:

- Asegúrese de que tenga licencia y seguro
- Pídale referencias de su trabajo de eliminación de los chinches y verifíquelas
- La compañía deberá entregarle un plan de acción detallado (véase la hoja de información de SPCP “Cómo contratar a un profesional de control de plagas para eliminar los chinches”).
- En el plan de acción se deberán recomendar actividades de preparación para los encargados y los inquilinos
- Desconfíe de los precios muy bajos
- Cuídese de las “garantías”
BED BUG CHECKLIST FOR TENANTS

Do you think you have a bed bug problem? Are you...

1.) Waking up with bite marks, usually in a line or a circle?
2.) Seeing red smears or stains on your sheets, mattress, or other furniture near your bed?
3.) Seeing live or dead bed bugs through a magnifying glass?

If you answered yes to any of the above, you may have a bed bug problem. Use this checklist to help you figure out what to do next.

WHAT CAN YOU DO?

Right away:
- Pull bed away from wall
- Put clothes, bedding, and other items in dryer for at least 20 minutes on HIGH heat
- Once you remove items from dryer, seal them in bags so bugs cannot get in again
- Vacuum on a regular basis. Remove vacuum bag or contents, place into a plastic bag, seal tightly, and dispose right away.

Over the next few days:
- Buy a bed bug mattress and/or box spring cover
- Caulk all cracks and crevices, such as along baseboards and around windows
- Paint or seal your headboard/bed frame AND nightstand
- Eliminate clutter
- Do not store items under the bed
- Continue to vacuum at least once a day
- Launder clothing and bedding regularly

If the problem remains:
- Steam clean
- Use least-toxic bed bug products where appropriate
- Call your local elected official
- Talk to your neighbors and organize

DO call your landlord
DO call your Alderman's office
DO talk to someone who can help you like: Local or State Health Department University Extension office
DO always read and follow directions when using pesticides

DON'T throw away your furniture or belongings
DON'T panic
DON'T bug bomb
DON'T use pesticides not approved for bed bugs
DON'T spray mattress or self unless pesticide is labeled for such use

IF YOU SUSPECT BED BUGS ARE IN YOUR HOME: DOS AND DON'TS.

Safer Pest Control Project is a not for profit organization dedicated to reducing the health risks and environmental impacts of pesticides and promoting safer alternatives in Illinois.

LISTA DE COMPROBACIÓN ACERCA DE LOS CHINCHES PARA INQUILINOS

¿Piensa que tiene una infestación de chinches?...

1.) ¿... amanece con picaduras, que en general forman una línea o un círculo?
2.) ¿... nota marcas o manchas rojas en las sábanas, el colchón o algún otro mueble ubicado cerca de la cama?
3.) ¿... puede ver chinches vivos o muertos con una lupa? Si contestó “sí” a alguna de las preguntas anteriores, puede que tenga una infestación de chinches. Utilice esta lista de comprobación como ayuda para saber qué hacer a continuación.

¿QUÉ PUEDE HACER?

Enseguida:
- Retire la cama de la pared
- Ponga su ropa, la ropa de cama y otros artículos en la secadora a la temperatura máxima por lo menos durante 20 minutos
- Una vez que haya sacado los artículos de la secadora, colóquelos en bolsas selladas para que los chinches no puedan meterse
- Pase la aspiradora con regularidad. Saque el contenido o la bolsa de la aspiradora, colóquela en una bolsa de plástico, séllela bien y deséchela enseguida

Durante los próximos días:
- Compre un colchón que proteja contra los chinches y/o un forro para la base
- Enmasille todas las grietas y hendiduras, por ejemplo a lo largo de la cabecera y alrededor de las ventanas
- Pinte la cabecera/el marco de la cama y la mesa de noche
- Elimine el desorden
- No guarde objetos debajo de la cama
- Sigua pasando la aspiradora por lo menos una vez al día
- Lave frecuentemente las prendas de vestir y la ropa de cama

Si sigue el problema:
- Limpie con un limpiador de vapor
- Aplique los productos menos tóxicos donde corresponda
- Llame a su representante local elegido
- Comuníquese con sus vecinos y organícese

SI SOSPECHA QUE HAYA CHINCHES EN SU CASA: QUÉ HACER Y QUÉ EVITAR

- Sí: llame al dueño de la casa
- Sí: llame a la oficina de su concejal (Alderman)
- Sí: hable con alguien que pueda brindarle ayuda como:
  - Un representante del Departamento local o estatal de salud
  - Un representante de una oficina de extensión universitaria (University Extension office)
- Sí: lea y siga siempre las instrucciones al aplicar los pesticidas

- NO deseché los muebles o sus pertenencias
- NO se asombre
- NO utilice nebulizadores
- NO aplique los pesticidas que no hayan sido aprobados para el uso contra los chinches
- NO aplique los pesticidas en los colchones o en su persona a menos que hayan sido calificados para esta clase de uso
Preparing for Conventional Bed Bug Treatment
Multi-Unit Residence

Proper preparation before treatment is essential for effectiveness. This preparation protocol is for conventional chemical treatment. Some treatments do not require this level of preparation or may require more. For example, heat treatment requires minimal preparation. Always follow the instructions of a well qualified reliable pest control professional if hired.

Do not remove any items from the infested rooms before treatment. By doing this you increase the possibility of spreading the bed bugs to other rooms and units.

Before Treatment

1. Move all furniture at least two (2) feet away from walls.

2. Have all drawers in dressers, nightstands, vanities, and armoires removed and emptied for inspection. Store contents in sealable plastic bags or tightly secured garbage bags.

3. Washing/drying clothes and linens
   a. Wash clothes with laundry detergent using the hottest water temperature setting that is practical. Next, place all items that are “dryer safe” in the dryer on high heat for at least 20 to 45 minutes. Store items in sealable plastic or tightly secured garbage bags after drying.
   b. Items that are ‘dry clean only’ should be placed in sealable plastic or tightly secured garbage bags and brought to the dry cleaners. Dry cleaners should be notified of the infested items so the infestation does not spread within the facility.

4. Remove all sheets, pillowcases, and blankets from the beds and wash on the highest water temperature setting that is practical. Place washable/dryable items in the dryer on high heat for 20 to 45 minutes. Store in sealable plastic or tightly secured garbage bags afterwards.

5. Place both the mattress and box spring on their side – the pest control company will need to have access to the underside of the bed. Remove everything from the headboard(s). Store all items in sealable plastic or tightly secured garbage bags.

6. Remove all children’s toys and any other items that children can put in their mouth, especially those items on the floor, from the infested rooms. Place washable/dryable items in the dryer on high heat for 20 to 45 minutes. Items may also be put in sealable plastic bags or tightly secured plastic garbage bags and then placed in the freezer for four days, if practical. After washing/drying or freezing, store all items in sealable plastic bags or tightly secured garbage bags.

7. Remove all items found on the floor of closets and underneath the beds in infested rooms, wash/dry as appropriate and store in sealable plastic or tightly secured garbage bags.

8. Remove all pet bedding, wash/dry as appropriate and store in sealable plastic or tightly secured garbage bags.
9. Unless otherwise instructed, remove all items from coffee/end/sofa tables as well as bookshelves, hutches, TV stands, cd/dvd/tape cabinets and entertainment units in rooms to be treated. Store items in sealable plastic or tightly secured garbage bags.

10. Place all sealed or secured plastic bags in an area where they will not restrict access to infested rooms.

11. Roll up all “area” or “throw” rugs and place together in an area where they can be treated.

12. Vacuum floors and use a crevice tool/wand around moldings of the room(s) to be treated. Thoroughly vacuum all furniture, mattresses, pillows, upholstery, and curtains. It is very important to focus on creases, buttons, cording, and folds. After vacuuming, dispose of the vacuum bag or the contents of the bagless vacuum canister in a plastic bag. Seal the bag tightly and immediately dispose of it in a garbage container outside the home. Thoroughly wash the bagless vacuum canister with hot soapy water to eliminate any bed bugs and eggs. Clean or mop all vinyl, ceramic and wood floors.

13. Unplug electrical equipment such as computers, TVs, alarm clocks, etc. in rooms to be treated. Remove electrical wall plates. This will allow the pest control operator to treat wall openings.

14. DO NOT discard mattresses or furniture until a pest control operator does an inspection. Mattresses and furniture often do not need to be discarded. New mattresses or furniture should NOT be purchased until after the infestation has been eliminated.

15. Notify pest control operator of any allergies, chemical sensitivities, or similar medical conditions prior to treatment.

16. We strongly recommend that small children, elderly persons, people with respiratory problems and pets vacate the premises during the treatment and stay away for at least four (4) hours or until any treatment product has dried, whichever period is greater.

17. Inform building management if assistance is needed to complete any of the above tasks.

**After Treatment**

1. Leave your home for at least four (4) hours or until any treatment product has dried, whichever is greater. Keep pets and children off treated surfaces until any treatment product has dried.

2. Keep all windows open.

3. Wipe off furniture tops in treated rooms and wash all cribs and headboards.

4. Do not make bed until treatment is finished and beds are dry.

5. Do not sleep in the room for a minimum of four (4) hours or until any treatment product has dried, whichever is greater. It is recommended that beds be encased in a zip-up mattress cover made of cloth or tear-resistant plastic for up to one year. Zippered mattress covers offer some protection from bed bugs by trapping them in the encasements. The bed bugs will eventually die over a period of a year. These do not replace any other treatment methods.

6. Replace electrical wall plates.

7. Items should be inspected and cleaned before returning them to areas underneath the bed or in the closet.

8. Items should be inspected and cleaned before returning them to bookshelves, hutches, TV stands, cd/dvd/tape cabinets and entertainment units.

9. Depending on your treatment plan, you may need to keep clothing, coats, shoes, linens and other fabric-based items in plastic bags for anywhere from several weeks to months in order to ensure that your items do not become re-infested. Be sure to check with the pest control operator or landlord for a date when you can safely return belongings to closets or dressers.
Inspecting for bed bugs requires a keen eye and attention to detail. Whether you suspect you have a bed bug problem or you just want to make sure you don’t, here is a basic inspection technique to help you find out.

**Tools needed:**
1. Reporting form
2. Magnifying glass
3. Tweezers
4. Small jar(s) with lid or tape and cardboard to collect samples (Collecting a sample allows for positive identification of a bed bug problem.)
5. Labels for collection container/cardboard to identify where the sample was found
6. Pen or pencil
7. Camera to document findings

**Start with the beds or other sleeping areas** (if someone regularly sleeps all night on the couch, then that's a “sleeping area”). You'll be looking for signs of bed bugs (living or dead), their eggs, and staining. Make sure to check all creases, cracks, crevices, and seams since these are the areas that bed bugs like most.

1. Pull back the bed spread and check the top sheet.
2. Repeat with the bottom sheet and mattress pad.
3. Remove bedding (if you have seen signs of bed bugs put bedding in a plastic bag and seal).
4. Check the top, bottom, and all seams of the mattress including the box spring.
5. Check the bed frame – pay attention to cracks and crevices.
6. Check the head/foot board by moving it away from the wall. Check the legs, crevices (especially upholstery creases and seams), back, and the area between the head/foot board and the bed mattress.

**Check any furniture near the bed, including:**
1. Night stands
2. Wall hangings – pictures, posters, etc.
3. Rugs
4. Items stored under the bed

**Check other furniture in the room:**
1. Dressers
2. Armoires
3. Chairs, tables, storage units

**Check the closet especially if it’s close to the bed.** Look in and under stored items or clothing that is not worn often.

**Move to other rooms.**
Pay close attention to upholstered furniture or stationary clutter (piles of newspapers and magazines, bags of clothes, etc.).

**Problem Found…**
Notify your building manager immediately (see form on reverse side). Waiting will only lead to bigger problems. Remember, anyone can get bed bugs and it has nothing to do with cleanliness. There’s no need to be embarrassed or afraid to report an incident.

**No Problem Found…**
Be proactive. Clean up clutter, remove stored items from under the bed, and store them and other rarely used items in sealed plastic containers or bags. Vacuum thoroughly including all furniture, beds, and along baseboards. Encase your mattress in a bed-bug-proof cover.
Sample
RESIDENT BED BUG REPORTING FORM

Name (optional) ___________________________________________ Date ____________________________

Address ___________________________________________ Unit ____ City ___________ State ____ Zip _________

How would you like us to contact you?
☒ Phone ___________________________________________ ☐ Email ___________________________________________

How many rooms are in your unit? _______________________

What signs of bed bugs have you seen or experienced? (Bites, live bed bugs, stains/smears on furniture, etc.)
___________________________________________________________________________________________________________________

<table>
<thead>
<tr>
<th>Where and what type of evidence have you noticed? (Please check all that apply)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bed Room</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>Live Bugs</td>
</tr>
<tr>
<td>☑</td>
</tr>
<tr>
<td>Dead Bugs</td>
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<tr>
<td>☑</td>
</tr>
<tr>
<td>Dark Stains/Smears</td>
</tr>
<tr>
<td>☑</td>
</tr>
<tr>
<td>Eggs</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

When did you first notice the problem? Date ____________________________

Have you recently traveled or hosted visitors from out of town?

☒ Yes ☐ No

If “Yes”, please describe ___________________________________________

Have you recently purchased or recovered any used furniture?

☒ Yes ☐ No

If “Yes”, please describe ___________________________________________

Are there any children, pregnant women, elderly, people with allergies/asthma/health issues, or pets in your home?

☒ Yes ☐ No

If “Yes”, please describe ___________________________________________
**Sample**

**BED BUG FURNITURE INSPECTION AND DISPOSAL PROTOCOL**

**Purpose:**
This is a sample furniture inspection and disposal protocol designed to be used by building managers and landlords to develop their own building specific protocol. Developing a system for inspecting and disposing of potentially infested furniture - in conjunction with resident/staff education - will prevent infested furniture from entering the building or spreading bed bug problems to other units.

**Acquired Furniture Policy:**
1. Purchase or obtain furnishings from a “low risk” reliable source. Do not purchase used beds, and be cautious of disposed furniture and other household items in alleys or along roads.
2. Inspect for bed bugs before bringing it into the building:
   a. Look in all seams, cracks and crevices
   b. Look in fabric rips and tears
   c. Turn furniture over to see underside and back
   d. Remove drawers - inspect the drawer and the drawer cavity
   e. Using a magnifying glass can be helpful
3. If bed bugs or eggs are identified...
   a. DO NOT purchase or bring the piece into the building, and if possible, inform the owner of your suspicions.
   b. Refer to the bed bug infested furniture disposal protocol below
4. If bed bugs or eggs are identified AND you still want the piece...
   a. Vacuum, steam clean, wash, or otherwise treat all surfaces of the the infested piece of furniture – concentrate on the areas identified as infested
   b. Re-inspect the piece to insure that all evidence of bed bug infestation has been eliminated
   c. Retreat and repeat inspection as necessary
   d. Consider re-painting or sealing suspect furniture before transporting
   e. Wrap furniture in plastic for transport into the unit

**Furniture Disposal Policy:**
Management will design building-specific protocol for disposing of all furniture and other household items. This protocol should include the following:

1. Guidance on the treatment of infested items already owned (see Acquired Furniture Policy #4)
2. Notification guidelines for disposing of furniture regardless of infestation status:
   a. Tenants will not always be aware of bed bug infestations
   b. Tenants may be embarrassed to inform management of infestation
3. Disposal guidelines for all furniture including:
   a. Wrapping for disposal – where appropriate management can provide plastic sheeting or other means of containing potentially infested furniture
   b. Labeling/treatment especially when infestation has been identified
   c. Path for furniture to be removed from building
   d. Location for disposing of items
   e. Regularly scheduled furniture disposal pick up including dates, times, and locations
   f. Special pick-up arrangements for infested furniture, e.g., no more than 24 hours after disposal

**Education:**
Educating residents on proper inspection and disposal of furniture is the key to preventing the spread of bed bugs. Once a protocol is developed, it must be communicated to all residents without exception and periodically repeated. With the proper education, your tenants can become an ally in preventing your building from ever becoming a bed bug haven.

Safer Pest Control Project is a not for profit organization dedicated to reducing the health risks and environmental impacts of pesticides and promoting safer alternatives in Illinois.

4611 N. Ravenswood Ave., Suite 107, Chicago, Illinois 60640
Tel: 773/878-PEST (7378)  Fax: 773/878-8250  Web: www.spcpweb.org

©
# Sample

## Unit Bed Bug History and Inspection Log

<table>
<thead>
<tr>
<th>Building Manager</th>
<th>Company Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Address | Unit Number | Initials of recorder | Date | Evidence? | Location of evidence? | Square footage of infested area, if known | Are there any children, pregnant women, elderly, people with allergies/asthma/health issues, or pets in the unit? | Other details or comments (e.g., are they cooperative?) | Adjacent units inspected? (Yes/No) | Actions taken Chemicals used? Fill in 'Chemical Controls' section. | Initials | Date | Chemical Name & EPA Reg. # | Where Applied | How Much | Observations |
|---------|-------------|----------------------|------|-----------|-----------------------|------------------------------------------|---------------------------------------------------------------------------------|-------------------------------------------------|-----------------------------------------------|-----------|-------|------------------|--------------|---------|--------------|
|         |             |                      |      |           |                       |                                          |                                                                                 |                                                 |                                               |           |       |                  |              |         |              |
|         |             |                      |      |           |                       |                                          |                                                                                 |                                                 |                                               |           |       |                  |              |         |              |
|         |             |                      |      |           |                       |                                          |                                                                                 |                                                 |                                               |           |       |                  |              |         |              |
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|         |             |                      |      |           |                       |                                          |                                                                                 |                                                 |                                               |           |       |                  |              |         |              |
|         |             |                      |      |           |                       |                                          |                                                                                 |                                                 |                                               |           |       |                  |              |         |              |

**Evidence and Action Taken**

**Chemical Controls Applied**

**Comments and Other Observations:**
Sample
Bed Bug Information/Introduction Letter

[Insert Date]
[Insert Contact Information]

Dear [Insert Resident’s Name],

You may have read or heard that bed bugs are spreading in apartment buildings in the United States. We do not have a bed bug problem in this building now, but we want to make sure you have a safe and healthy apartment. We want to let you know a few things about bed bugs, to make sure bed bugs are stopped at the front door.

If you think you have a bed bug problem in your apartment or that there is one in the building, contact management right away at _______________________. Do not feel embarrassed or shy; bed bugs do not mean that your apartment is dirty. Bed bugs are great hitchhikers! They are easily picked up anywhere, from trips to other countries or when visiting friends.

Bedbugs spread quickly, so please help us to keep bed bugs out of the building. We have attached some fact sheets to help you understand the problem better:

1. General Bed Bug Factsheet
2. Tenant Bed Bug Checklist
3. Furniture Disposal Procedures
4. Inspecting for Bed Bugs

Please read these fact sheets carefully. They will help you understand and give you more control and hopefully, prevent bed bugs from becoming a problem in your apartment.

We will let you know if bed bugs are found in the building. We need your help to avoid the problem. If needed, your unit may be inspected and treated. All information will be given to you at that time. Our hope is that we will never have a bed bug problem in this building.

Thank you for your help. We want to provide clean and safe housing for everyone. Remember to always let management know right away if you think you have a bed bug problem. Please contact us if you have any questions or concerns.

Management
Sample

Bed Bug Infestation Notification Letter

[Insert Date]
[Insert Contact Information]

Dear [Insert Resident’s Name],

We have been told that there is a bed bug problem in the building. We are doing everything we can to solve the problem.

Bed bugs spread quickly, so please help us stop the problem and prevent it from happening in other apartments.

Let us know right away if you see any of these:

- **Bites** - Small, reddish, and itchy, usually in a line or a circle.
- **Bed bugs** - Bed bugs are flat, oval-shaped, and wingless, between poppy-seed or apple-seed size. They are a rusty red color, but at younger stages they are lighter colored and more see through.
- **Droppings** – Bed bug droppings are dark colored stains or smears on bedding or bumps on hard surfaces. They often appear in clusters of dots.
- **Eggs** – Eggs are clear and very small and found among droppings or in cracks where adults hide.

If you think bed bugs are in your apartment, let us know right away. We will have an inspector come to your unit to see if you do have bed bugs, and to let you know what you should do about them. While you are waiting for the inspector to come, there are a few things you can do to protect your apartment and your family:

- Pull bed away from wall.
- Put clothes, bedding, and other items in the dryer for 20 to 45 minutes on HIGH heat.
- Once you remove items from dryer, seal them in bags so bugs cannot get in.
- Vacuum on a regular basis. Be sure to change the vacuum bag or empty the vacuum container into a bag often, and seal the bag before throwing it in the garbage.
- Don’t use any pesticides or foggers because they can cause the problem to spread. Wait for professional help.
- Use a bed bug mattress covers to make it easier to find out if bed bugs are present; you do not need to throw away your mattress.

Please see the attached fact sheet for more information about bed bugs.

Thank you for your help. We want to provide clean and safe housing. Please contact us if you have any questions or concerns.

Management
If you do not have the time or ability to research your pest problem and safely apply the appropriate procedures and materials to control it, you may want to hire a pest control service to do the job for you. A licensed professional also has access to some products not available in retail stores. To be effectively managed, many pest problems, like termites or problems on large trees, require specialized equipment, pesticides, and technical training.

Although professional services may seem costly, the investment may be worth it to solve a serious problem. A pest control professional, who practices integrated pest management methods and keeps up-to-date about the latest technologies, can provide you with the safest and most effective management strategies. If toxic chemicals are part of the pest management method, it is often safer for your family to have them handled by a professional.

### BEFORE HIRING A COMPANY

- **Identify the pest and do some research about how to control it following the steps below.**

  - If you are not certain of the pest’s identity, take it to your local University of California (UC) Cooperative Extension office or county agricultural commissioner’s office. You can look up their local telephone numbers in your telephone directory. Ask their advice about management solutions.

  - Check the online UC Pest Notes at [www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu) for information on managing the pest. Based on this information, determine if management is needed and if it is, whether or not you can safely and effectively address the problem yourself.

  - It may be possible for you to make changes in your landscaping or home design to permanently exclude or reduce pests and this can eliminate the need for professionals, even for serious pests. Examples would be to take out problem tree species and replace them with pest resistant ones or treat your pets with spot-on treatments for fleas and eliminate the need for treating carpets or outdoor areas for fleas.

  - Pest management professionals often have access to more effective pesticides or other management tools not available to consumers. If this is the case for your pest, you may want to consider professional help.

  - If repeated applications of a pesticide or procedures such as setting traps for skunks are required, ask yourself whether you have the skills or time to follow through. If not, hire a professional.

  - If toxic chemicals or sophisticated application equipment are required, it is often best to hire a professional.
Obtain recommendations from neighbors, friends, or family about pest control services they have used. Call at least three companies and consider their methods as well as their customer service policy:

2

- Find out what types of services the company offers. For example, do they provide monthly spray contracts or do they offer an Integrated Pest Management (IPM) approach that includes nonchemical methods?

- Find out if least-toxic alternatives are available to control the pest. Ask the company if these least-toxic pesticides or baits are used when appropriate. For example, confirm that exclusion methods, baits, and traps are employed against cockroaches (rather than sprays) and that baits (rather than sprays) are used for ants. For other examples of least-toxic approaches, look online at the UC Pest Notes, http://www.ipm.ucdavis.edu.

- Make sure the company has the required licenses, registration, certificates, and insurance.
  - Pest control companies and individuals making household treatments must operate with a license issued by the California State Structural Pest Control Board. Verify the status of a pest control company’s license online at http://www.pestboard.ca.gov/license.htm or telephone 800-737-8188.
  - Individuals operating landscape maintenance or gardening businesses and performing yard pest control must possess a pest control business license and a Qualified Applicator Certificate or a Qualified Applicator License (QAC or QAL) issued by the California Department of Pesticide Regulation. The licensee should carry an identification card with an expiration date. Verify the status of an individual’s certificate or a business’ license online at http://www.cdpr.ca.gov/docs/license/currlic.htm or telephone 916-445-4038.

3

Ask the company to inspect the site.

- The company may charge a fee to do this inspection, but for that fee they should provide you with a written diagnosis of the problem or an identification of the pest. They should show you where the pest is causing the problem and discuss how they plan to control it. The company should also provide you with details regarding the course of treatment(s), the pesticide to be used—if required, the frequency of inspections and treatment, and an estimate of the cost of implementing the treatment plan. They should also provide you with information about the safety of any products they may apply and any precautions you would need to take, such protecting pets and children.

4

Review the solutions.

- Consider long-term solutions to the problem. A company that practices IPM will suggest modification of the habitat or use of baits and monitoring, rather than just guarantee to spray on a monthly basis or when and if the pest reappears. An IPM program may include pest management strategies like installing screens on windows, adding sweeps on the bottom of doors, or altering when or how you water your yard.

- Consider your chemical tolerance. Ask which pesticides will be used, the active ingredients they contain, and their effects on pets, the environment, and people—especially the elderly, the very young, or persons with environmental sensitivities. Determine if there are specific legal requirements specifying precautions to be taken after application. You may request a copy of the Material Safety Data Sheet (MSDS), which describes chemical qualities, hazards, and safety precautions for each pesticide used. Contact the pest control company and your county agricultural commissioner if you have further questions about pesticides to be used or consult the online National Pesticide Information Center at http://npic.orst.edu/gen.htm or telephone 1-800-858-7378.
March 2006  Hiring a Pest Control Company

- Ask how any pesticides will be applied and where. Chemicals sprayed around the home perimeter may be washed away by irrigation or rain, especially if concrete walkways or other water-repelling materials surround the home. Avoid this type of spraying as it is considered ineffective, costly, and may cause contamination of our waterways or drinking water.

- Avoid companies that offer only calendar chemical treatments featuring automatic monthly or quarterly perimeter sprays. This may or may not be necessary, as the pest may or may not be present at the time of application, and it is not an integrated or long-term pest management approach. Some approaches such as baiting for termites, do require regular monitoring and refilling of bait stations.

5 Review the contract.

The company should present information on the identified pest problem, the reasons behind a chosen treatment and the application techniques. A contract should state the following.

- Name of the company
- Length of the service
- Treatment plan
- Price
- Guarantee

A reputable pest control company should carry both general liability insurance and worker's compensation insurance. Check the back of the contract for additional details, including possible exclusions. Can you or the company cancel the contract without penalty? Is there an arbitration clause or other method to settle a possible dispute?

AFTER HIRING A COMPANY

6 Stay in touch with the company to ensure that you are getting the service stated in your contract.

- Verify that the company is monitoring pest populations as agreed in the contract.
- Communicate to the company the levels of pests that are tolerable as well as intolerable. For example, you may tolerate ants in the landscape, but not inside the home.
- Inform the company of any changes in pest populations that you notice between visits.

7 Do your part to help manage the pest.

- In most cases, an effective pest management program will require that the customer carry out certain practices to reduce pest problems. These may include cleaning up food sources or areas that harbor pests such as removing woodpiles or debris, fixing plumbing leaks, or repairing structures. If you don't do your part to follow through with these recommendations, the pest management program may fail to solve the problem.
March 2006

Hiring a Pest Control Company

Checklist for Working with a Pest Control Company

1. Identify the pest and do some research about how to control it.
2. If you decide to hire a professional, obtain recommendations from neighbors, friends, or family about pest control services they have used.
   - Call at least three companies and consider their methods as well as their customer service policy.
   - Find out what types of services the company offers.
   - Find out if least-toxic alternatives are available to control the pest.
   - Make sure the company has the required licenses, certificates, and insurance.
3. Ask the company to inspect the site.
4. Review the solutions.
   - Consider long-term solutions to the problem.
   - Consider your chemical tolerance.
   - Ask how the pesticide will be applied and where.
   - Avoid companies that offer automatic monthly or quarterly sprays.
5. Review the contract.
6. Stay in touch with the pest control company.
   - Verify that the company, as agreed in the contract, is monitoring pest populations.
   - Communicate to the company the levels of pests that are tolerable.
   - Inform the company of any changes in pest populations.
7. Do your part to help manage the pest.
   - Clean up food sources.

For more information contact the University of California Cooperative Extension or agricultural commissioner’s office in your county. See your telephone directory for addresses and phone numbers.


COORDINATION, DESIGN, & PRODUCTION: P. Galin

ILLUSTRATIONS: Adapted from various IPM Statewide Program publications.

Produced by IPM Education & Publications, UC Statewide IPM Program, University of California, Davis, CA 95616-8620

This Pest Note is available on the World Wide Web (www.ipm.ucdavis.edu)

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**How to Hire a Pest Control Operator for Bed Bugs**

**Call several companies.** Introduce yourself and explain your interest in safer, more effective bed bug control through Integrated Pest Management.

- **It is important to shop around**—not all pest control companies are the same; make sure you spend the time to find the right company.
- **Don’t just go with the lowest bid**—make sure you hire a company that will really treat the problem. This may not mean the company that is the cheapest, but it will save you time, and even money, to treat it properly the first time.

**When you call ask the following questions:**

1) **Do they offer an Integrated Pest Management (IPM) option?**
   - IPM should include the following services:
     - Inspection
     - Monitoring
     - Guidance on policies and activities you should put in place to prevent bed bugs from becoming a problem
     - Recommendations for preventing bed bug problems from spreading
     - Treatment strategies that go beyond pesticide treatment such as heat treatments, steam cleaning, etc.
     - The use of least-toxic pesticides approved for bed bugs

2) **Do they offer a building assessment?**
   - The assessment will help determine where and when you got the bed bugs to avoid future infestation.

3) **Do they provide a pre-treatment checklist?**
   - It is essential that certain steps be taken before treatment for it to be effective, such as reducing clutter, cleaning, and washing linens and other items. If they do not provide pre-treatment preparation instructions, look elsewhere.

4) **Do they perform a pre-treatment inspection?**
   - To treat for bed bugs, the technician must know where they are located. An initial inspection by a trained technician will identify areas to treat.

5) **Do they offer steam cleaning or other types of heat treatments?**
   - Applying heat is one of the best ways to kill bed bugs. Steam cleaning is a safe, environmentally friendly way to kill bed bugs and their eggs. Steaming correctly can make using pesticide sprays unnecessary.

6) **Do they recommend mattress covers?**
   - Encasing mattresses in a zippered cover after treatment can help prevent future infestation. A pest control company that focuses on IPM should recommend using a mattress cover.

7) **Do they only use pesticides recommended for bed bugs?**
   - Pesticides are designed to be used for specific pests and by a specific method. For example, some pesticides are illegal for use on mattresses. Ask for the names and labels of pesticides to insure proper use.

8) **Do they provide service reports of work performed and written recommendations of further actions to take to maintain a bed-bug-free facility?**
   - Service reports and IPM recommendations will help you prevent bed bug problems in the future.

9) **Do they provide references?**
   - A reputable bed bug treatment company will give you references of previously treated facilities. Get those numbers and make sure to call.

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**Canine Scent Detection: Pros and Cons**

Canine scent detectors are another tool for dealing with bed bugs. Dogs are trained to react to the scent of bed bugs and can be useful for low-level, hard-to-find infestations. It is best to use canine detection with a licensed pest control operator. Be sure to check references and request certification credentials and a demonstration.

**Keep in mind:**

- There are no state or federal licensing requirements for dogs, but in Illinois, trainers should have their structural pest control license.
- The quality of the dog depends on the quality of the training. Ask how the dog is trained and how often.
- Dogs should be able to identify live and dead bed bugs.
Bed Bug Control Overview for Landlords

Bed bug complaint

Start
Unit History Log

Assist residents
- Cleaning
- Laundering
- Proper disposal

Inspect unit: internally and/or hire qualified professional

Problem verified?
No
Send letter to residents w/ bed bug factsheet

Yes

Send treatment preparation guidelines to affected residents

Inspect adjacent units

Educate all residents
- Letter & factsheet
- Building meeting

Begin treatment

Follow-up: inspections/monitoring

Problem eliminated?
No
Repeat treatment (if necessary)

Yes

- Continue education
- Routine pest control
- Periodic inspection

Preventative Measures (before bed bug problem)

Create protocols & forms
- Reporting (complaint form & tracking logs)
- Disposal
- Furniture inspection

Protocols created?
No
Inform residents

Yes

Visual survey (bites, stains)
Maintain (vacuum, clean)

Update Unit History Log
Bed bugs are blood-sucking insects in the family Cimicidae. Both nymphs and adults feed on humans mostly at night, a time when it is difficult to detect their stealthy habits.

*Cimex lectularius* is a cosmopolitan, or widely distributed, species, most frequently found in the northern temperate climates of North America, Europe, and Central Asia. It occurs more sporadically in southern temperate regions. In tropical regions, *C. hemipterus* is the dominant species, but this species does not occur in California. The most common species found in California is *C. lectularius*.

The growth and development of *C. lectularius* is optimal when it feeds on humans; however this insect also feeds on other species of mammals and birds found near the home including chickens, mice, rats, and rabbits.

Until recently, bed bug infestations were thought to be associated primarily with crowded and dilapidated housing. However, such infestations have undergone a resurgence and can be found even in the finest hotel and living accommodations. The reasons for the resurgence are not totally understood but appear to involve increased human travel, ease of movement of infested luggage and items, and changes in the pesticides available to control this pest.

**IDENTIFICATION AND LIFE CYCLE**

Adult bed bugs (Fig. 1) are oval, wingless, about $\frac{1}{5}$ inch long, and rusty red or mahogany. Their bodies are flattened, they have well-developed antennae, their compound eyes are small, and the area behind the head (the prothorax) expands forward on either side of the head. The immatures appear identical to the adults except for their smaller size, thinner outer skeleton (cuticle), and lighter, yellowish-white color.

Bed bugs are readily distinguished from another common blood-sucking species, conenose bugs (see Pest Notes: Cone-nose Bugs listed in References), by their smaller size, more rounded shape, and lack of wings as adults. Conenose, or kissing, bugs may be up to $\frac{3}{4}$ inch long.

Female bed bugs lay 200 to 500 tiny, white eggs in batches of 10 to 50 on rough surfaces such as wood or paper. Glue-like material covers the eggs, which hatch in about 10 days. After hatching occurs, the eggshells frequently remain stuck in place.

There are five progressively larger nymphal stages, each requiring a single blood meal before molting to the next stage. The entire life cycle (Fig. 2) from egg to adult requires anywhere from 5 weeks to 4 months, depending on temperature and availability of food (blood). When temperatures are in the range of 70° to 82°F, development occurs most rapidly.

Nymphs and adults generally feed at night and hide in crevices during the day. Common hiding places include seams in mattresses and box springs, cracks in bed frames, under loose wallpaper, behind picture frames, and inside furniture and upholstery. Occasionally people pick up bed bugs in theaters or on buses and trains. They also can bring them into their home on clothing, bedding, luggage, or firewood.

Bed bugs can go without feeding for 80 to 140 days. Older stages of nymphs can survive longer without feeding than younger ones, and adults have survived without food for as long as 550 days. A bed bug can take six times its weight in blood, and feeding can take 3 to 10 minutes. Adults live about 10 months, and there can be up to 3 to 4 generations of bed bugs per year.

**DAMAGE**

Bed bugs feed on humans, usually at night when they are asleep. They feed by piercing the skin with their elongated mouthparts, which consist of two stylets that normally fold under their body when at rest but fully extend during blood-meal feeding. One stylet has a groove that carries saliva into the wound, while the other has a groove through which body fluids from the host are taken in.

A single feeding may take up to 10 minutes, and feels like a pin prick, but because feeding usually occurs at night when people are asleep they are not aware they have been bitten until afterwards. However, saliva injected during the feeding can later produce large swellings on the skin that itch and may become irritated and infected when scratched. Swelling may not develop until a day or more after feeding, and some people do not show symptoms. Bed bugs currently are not considered to be disease carriers.
Distinguishing bed bug bites from the bites of other arthropods such as mosquitoes, fleas, and spiders is difficult. People often confuse itching bed bug welts for mosquito bites. The only way you really can confirm bed bugs are the cause is to find the bugs in your bed or bedroom. Often people are bitten when traveling, making diagnosis even more difficult.

In addition to the direct injury to humans, bed bugs have stink glands that leave odors. They also leave unsightly fecal spots on bed sheets and around their hiding places. These spots are darkish red in color, roughly round, and can be very small.

MANAGEMENT
Managing a bed bug infestation is a difficult task that requires removal or treatment of all infested material and follow-up monitoring to ensure the infestation has been eliminated and does not return. Management will require employing several nonchemical methods such as vacuuming, washing bedding at a high temperature, using steam or heat treatment, and sealing up hiding places.

Insecticides may be required to eliminate serious infestations; however few active ingredients are federally registered for bed bugs for over-the-counter use. At the professional control level, there are more registered products; however, resistance among bed bug populations is common, and low-level infestations are difficult to detect. There has been some success combining chemical and nonchemical products with increased sanitation and habitat modification.

Monitoring and Detection. You can detect a bed bug infestation by searching for the pests or their fecal spots, egg cases, and shed skins (exuviae). Current research reports more than 85% of bed bugs are found in or near the bed, so inspections for infestations should focus on the mattress, bed frame, and headboard areas. Lift the mattress and inspect all seams and surfaces as well as the box springs. You may need to dismantle the bed. Use a flashlight to aid the inspection process.

Remember, these nocturnal insects are small. Although you can see adults and aggregations of nymphs with the unaided eye, seeing the eggs requires a hand-magnifying lens. It may be easier to detect dark spots of dried bed bug excrement or the insects’ light-colored shed skins. A foul, rotting, bloody-meat smell might be present in heavily infested areas.

In addition to the bed area, the remaining 15% of infestations usually are in upholstered furniture other than beds, in bedroom cabinets, along baseboards, under wallpaper, and in carpets, wall hangings and similar hiding spots. Bed bugs prefer fabric or wood surfaces to metal or plastic. For heavy infestations, adjoining rooms, filing areas, and clutter can be out-of-way shelters. It takes patience and perseverance to find low-level infestations of such a persistent, nagging problem.

Recent research has shown searching with dogs can be an effective method for finding bed bug infestations. Under laboratory and simulated-field conditions, using dogs to search for bed bugs was 97% effective. Other recent research indicates using small, double-cupped monitors that are easily installed on the leg ends of beds trapped six times more bed bugs than were found from human visual searches alone. This trap, Interceptor, is commercially available.

A new university study indicates an airborne aggregation pheromone, a behavior-modifying chemical, might help control infestation levels. With this new research, hopefully traps attractive to bed bugs soon will be commercially available.

Prevention. People usually bring bed bugs into their homes, in luggage or on clothes, after visiting an infested dwelling or hotel. If you travel frequently,
watch for signs of bed bugs in your hotel room by checking under sheets and inspecting mattresses, especially if you have been bitten. If you suspect bed bugs, check your luggage before leaving and wash all your clothes as soon as you get home.

You also can bring bed bugs into your home on bedding or furniture. If you purchase second-hand furniture, especially beds or mattresses, thoroughly inspect the item before bringing it into your home. If you remove infested mattresses or furniture from your home, do not leave it on the curb or porch. Take it immediately to the dump.

Managers of hotels, furnished apartments, dormitories, homeless shelters, and other facilities that house transient populations need to train staff to recognize signs of bed bug activity and take action as soon as they find an infestation. One proactive step a manager can take is to regularly replace beds, mattress, and bedding materials. Frequent laundering of bedding and placing items that could be infested in walk-in freezers during tenant change and turnover can help prevent the spread of bed bugs.

It is much easier to control a population when the infestation is small. Keep clutter down, so it is easier to inspect and bed bugs have fewer hiding places. Also, seal up cracks, crevices, and holes in bedding or furniture and other potential hiding sites.

Nonchemical Management. In addition to preventing the introduction of bed bugs, a number of other nonchemical control methods can help manage this pest. These methods are directed at killing or removing bugs or restricting access to beds or bedding materials.

You can remove bed bugs and eggs with the suction wand of a strong vacuum; however, you must target the vacuum on the seams of mattresses and box springs, along perimeters of carpets, under baseboards, and in other areas where bed bugs live. A single vacuuming rarely gets all bugs and eggs and, therefore, should be repeated. Portable steam cleaners can also be used to clean mattresses and furniture.

Commercial heating services are available to treat entire rooms in homes for bed bug infestations. The current label use for commercial heating services is 140°F for two hours or 130°F for three hours, which will kill most bed bugs and eggs. In California, providers of heat services must be licensed and bonded by the Structural Pest Control Board when treating for wood destroying pests. Chilling to a temperature of 32°F or lower and maintaining this temperature for several days also will kill bed bugs.

For suspected infestations in clothing or bedding, a home laundry drier is very good at killing bed bugs; only 10 to 15 minutes exposure is needed.

Mattress encasements specifically designed to keep out bed bugs are commercially available. Encasements are particularly useful for hotels or other facilities with many beds; however, their effectiveness at excluding bed bugs has not been thoroughly researched. In many cases, the best approach may be to throw out the mattress, clean the area thoroughly, and install a new mattress—with or without an encasement.

Other management practices include sealing up hiding places such as cracks and crevices in walls and around windows and doors where bed bugs can hide. As a temporary measure, you can exclude bed bugs from clean beds by coating bed legs with petroleum jelly or placing them inside glass jars or metal cans, which are too slippery for bed bugs to climb.

Insecticides. Insecticides alone won’t control bed bug infestations. Their use must be combined with a program of removing and cleaning infested beds, bedding, and other harborage sites then following up with a regular detection program to ensure treatment was effective.

The most effective bed bug pesticides are available to commercial pesticide applicators only. Professionals also have the equipment and expertise that allow a more effective application of insecticides than residents could do themselves. In addition, professionals have the training to detect and isolate infestations, which often allows for more effective control.

Insecticides may be applied as liquids directly to cracks, crevices, bed frames, baseboards, or similar sites, or they may be applied as dusts in cracks and crevices. Pesticides generally are not applied to mattresses or bedding because of risk to people.

Liquid insecticide formulations include:

- Products containing the botanical insecticide pyrethrin, which gives quick knockdown but little long-term control;
- Various synthetic pyrethroid products (cyhalothrin, bifenthrin, deltamethrin, and permethrin); and
- Newer types of products including the pyrrole insecticide chlorfenapyr (Phantom) and the insect growth regulator hydroprene (Gentrol), which cause sterility in adults.

There is growing interest in the last two products, because some bed bug populations have developed resistance to pyrethroid insecticides and no longer can be effectively controlled by them. However, both newer products take up to several days to be effective.

Insecticides applied as dusts cling to the pest’s cuticle, wearing away the insect’s protective wax covering or poisoning the insect when it grooms itself. Several dust products used in bed bug management include boric acid, diatomaceous earth, fumed silica, and formulations of pyrethroids. These materials can provide long-term control as part of an integrated program if they are placed in out-of-the-way places—such as under baseboards or in wall voids—that don’t get wet.
Do-It-Yourself Treatments. Although over-the-counter pesticide products that have “bed bug control” written on the label can be found on store shelves, they generally are not recommended. Performance of these products under actual field conditions is not known. If you need to use a pesticide, you are better off hiring a licensed, professional pesticide applicator with experience in treating bed bugs (see Pest Notes: Hiring A Pest Control Company listed in the References).

Residents do have an important role to play when their homes are infested with bed bugs. Once professional treatment has occurred, you should continue to monitor for bed bugs daily. Also, keep down clutter and vacuum previously infested areas regularly.

REFERENCES


University of California scientists and other qualified professionals have anonymously peer reviewed this publication for technical accuracy. The ANR Associate Editor for Urban Pest Management managed this review process.

To simplify information, trade names of products have been used. No endorsement of named products is intended; nor is criticism implied of similar products that are not mentioned.

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WARNING ON THE USE OF CHEMICALS

Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original, labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Pesticides applied in your home and landscape can move and contaminate creeks, rivers, and oceans. Conﬁne chemicals to the property being treated. Avoid drift onto neighboring properties, especially gardens containing fruits or vegetables ready to be picked.

Do not place containers containing pesticide in the trash or pour pesticides down the sink or toilet. Either use the pesticide according to the label, or take unwanted pesticides to a Household Hazardous Waste Collection site. Contact your county agricultural commissioner for additional information on safe container disposal and for the location of the Household Hazardous Waste Collection site nearest you. Dispose of empty containers by following label directions. Never reuse or burn the containers or dispose of them in such a manner that they may contaminate water supplies or natural waterways.

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Control Strategies for Bed Bugs

Education

At the heart of any bed bug control program is education. People are the main source of food for bed bugs, and the primary way bed bugs are spread from location to location. Bed bugs hitchhike on people through their clothing, luggage and other belongings. As a result, bed bug control is as much about people management as it is physical, chemical or biological remedies. Few pest control companies will be able to guarantee success without the cooperation of building occupants.

Education is essential to ensure that building occupants actively and voluntarily cooperate in the control program. Occupants must promptly communicate any sign of bed bugs to the landlord or property manager. In addition, they must be informed how to properly prepare a space for treatment – whether minimizing clutter, removing linen, laundering clothes or properly storing items. Finally, occupants must be instructed on proper disposal methods for belongings. Furniture rarely needs to be thrown out; however, disposal without education can lead to bed bug infested items being brought back into the building by another occupant, spreading the problem. Proper education of occupants will help prevent this from happening and keep treatment costs down.

Education should also cover when and how to report bed bug sightings and control activities. Documentation is a crucial step to ensuring that the problem is effectively monitored, managed and brought under control. If no one is aware of the problem, how it is being treated or where it has spread to, then it cannot be addressed. People must be informed of the proper reporting and recording procedures, and encouraged to use them as often as is needed.

Education may include verbal explanations, answering questions, posting notices and distributing handouts in several languages. It will help if people understand bed bug biology and behavior, as well as proposed control strategies and techniques. Throughout a control program, continuous communication should be maintained between occupants, housing managers and pest control professionals.

Building owners and managers must also get educated on what to expect from a bed bug control professional. Far too often, inexperienced companies offer cheap services and make lofty promises about bed bug control. While this may be appealing, it is usually deceiving. For effective bed bug control a company must make repeat visits several weeks to several months after the initial treatment due to the inherent difficulty of eliminating bed bugs. Few competent professionals will make guarantees especially in severely infested buildings because of the potential for bed bugs to be reintroduced. While there are some promising technologies that appear to be very effective against bed bugs, nothing substitutes for vigilance and good communication.
**Inspection and Detection**

While not technically a control strategy, it is imperative that bed bug problems be verified by a professional to help focus control efforts and resources to those areas most in need. Owners and managers must also understand that inspection of adjacent units is standard and necessary; otherwise a problem might get overlooked that will lead to other bed bug outbreaks. Problems that seem to have been resolved have a tendency to reappear in a few weeks time without good inspection, education and control programs.

**Physical removal**

Bed bugs can be vacuumed from exposed hiding spots such as box spring edges, mattress creases, furniture seams and carpet edges, but their eggs are stuck tightly to surfaces and are usually hard to remove. Using a crevice tool, or vacuum wand, to scrape the surface can help dislodge some of the eggs.

A high efficiency particulate air (HEPA) filtered vacuum, which removes >99% of all particles >0.3 micron diameter, will ensure that many allergens associated with bed bugs and their debris are also removed. Vacuuming, especially during inspections, will immediately remove a significant portion of the pest population and will usually kill some of the bugs. Bed bugs may also be removed from exposed resting sites by pressing down on them with the sticky side of a commercially available tape, hand-picking them, or brushing them into a container of rubbing alcohol or soapy water.

**Exclusion**

Bed bugs have weak, flexible, piercing-sucking mouthparts, and weak, simple feet (tarsi), and claws. They are incapable of chewing or clawing through even a very thin coating of sealant or an unbroken layer of paper or cloth. Sealing almost any material, to completely cover a harborage opening, can halt bed bug movement. Once sealed inside, living bugs are effectively removed from the pest population and will usually die in place. Sealing most of the hiding spots can also restrict the bugs’ movements, temporarily reducing the intensity of their feeding.

Mattress headboards and frames can be painted with several coats seal off these hiding spots. Any cracks or crevices on walls or along baseboards should be painted or caulked with an appropriate sealant. This can prevent bed bugs from getting inside wall voids, where they can migrate to other locations in the building. Storing clothes and other items in plastic bags or tightly sealed containers can greatly reduce potential hiding spots.

Commercially available plastic mattress covers, at least 0.08 mm thick, usually with a zippered edge, can completely enclose a mattress or box spring and prevent any bed bugs harboring in them from accessing hosts. Originally developed to reduce human exposure to allergens in mattresses infested with house dust mites, such covers both seal in and exclude bed bugs.

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They may also be homemade using plastic sheeting that is sealed shut with durable, flexible tape (e.g., nylon fiber tape, duct tape) (Cooper and Harlan 2004). Plastic covers will not be work if they are ripped or torn, and must be completely sealed for maximum effectiveness.

More expensive options included fabric-based full mattress encasements. Good encasements consist of a tightly woven fabric that inhibits bed bug movement, and include a secured zipper system that prevents bed bugs from getting in or out. They are also more durable than plastic covers, and can be washed and reused.

Covers are best used after a mattress is treated for bed bugs. This will prevent outside populations from getting into the seams and folds, and will keep any newly hatched bed bugs on the mattress from getting out and feeding on occupants. Covers must be left on the mattress for a minimum of one year unless otherwise instructed by a pest control professional.

**Physical killing techniques** (heat, cold, controlled atmospheres, steam)

*Heat*

Since the early 1900s, bed bugs have been controlled by heating infested rooms or whole buildings to temperatures of at least 45 °C; the thermal death point for these pests. For heat treatment to be effective, it is critical that high temperature and low relative humidity be attained for a minimum length of time. Heat treatment works best with a combination of temperatures in the 49-52 °C (120-125 °F) range at 20-30% relative humidity for 20-30 minutes.

Heat treatment has an immediate and substantial effect, but does not provide long lasting control. Bed bugs can re-occupy any treated site as soon as temperatures return to normal. While there have been reports of physical distortion of structures and interior contents, whole room and building heat treatments are generally considered safe, and provide the added bonus of eliminating other insects that might be on the premises. Always consult with a knowledgeable pest control professional trained to use heat treatments and discuss their method in detail before contracting their service. Companies should be willing to offer service references, an important source of information when making contracting decisions for bed bug control.

One area where professional expertise is not required is laundering infested linens or clothes. Occupants can wash these items in hot water with detergent, followed by heat drying for at least 20 minutes in a clothes dryer on high heat, will kill all stages of bed bugs. This is an effective method, but will not prevent reinfestation of these items. They must be stored in plastic bags or containers after laundering until the problem is under control.

*Cold*

Exposure to low temperatures can kill bed bugs if they are kept cold enough long enough. Bed bugs can tolerate 5 °F (-15°C) for short periods and, if acclimated, they can survive at or below 32 °F (0°C) continuously for several days. Cold treatments of rooms or buildings to control bed bugs.
bugs have not been well studied, nor are they often employed. Freezing furniture or other items below 0 °F (-19 °C) for at least four days should adequately provide control, although this option is not practical for most people.

A new commercial technology uses liquid carbon dioxide (CO₂), stored at very cold temperatures, to deposit a super-cooled “snow” on materials that kills bed bugs and other pests by rapid freezing. This snow evaporates into a gas, and does not leave behind any residue. As with heat treatment, freezing does not offer long lasting control as the effects are immediate, so reinfection may become an issue.

Steam

Steam treatments have been used effectively by pest control professionals to quickly eliminate live bugs and their eggs from the seams of mattresses and furniture. However, this technique requires practice and care. Most retail steam cleaners do not generate enough heat to be effective. Commercial steam cleaners must typically be used to generate the temperatures necessary to quickly kill bed bugs. These devices often operate at temperatures well in excess of 180 °F, and can pose a scalding hazard to the operator if used improperly. Manufacturer’s instructions must be followed concerning the steam generating devices’ operation, maintenance and safety precautions.

When selecting a device, look for a vapor or dry steam cleaner. These products produce steam with less moisture than conventional steam cleaners, which reduce the risk of water damage and mold growth. Most professionals use multiple-jet or wide steam heads to cover more surface area with each pass of the steam head, and will usually wrap the head in a small towel to intensify the heat. Triangular and rectangular heads are very common. Smaller steam heads and those equipped with brushes should generally be avoided as the steam pressure and bristles may inadvertently dislodge bed bugs from the surface material onto the floor. However, these may be appropriate when the area is too small for a larger head to adequately clean.

Steam treatment speed will vary; however, general recommendations are to pass the steam head across the surface at the rate of 1 foot (30 cm) every 10 to 15 seconds. It is also important to test the steam cleaner’s impact on small section of material to check for possible damage before steaming the entire surface.

Pesticide Applications

Currently, most non-chemical products and techniques do not quickly or efficiently eliminate established bed bug populations. In many cases, the judicious application of a pesticide by a certified pest control professional is necessary. However, bed bugs have developed an extraordinary resistance to most classes of pesticides. This means that a chemical only approach is insufficient. The best programs combine targeted pesticide applications with non-chemical treatment options.
Any pesticide used should be labeled specifically for bed bug control and, where necessary for use on belongings such as mattresses and furniture. Many over-the-counter aerosol products are not labeled for bed bug control, and should not be used only on belongings or surfaces as specifically stated on the pesticide label. It is in everyone’s best interest to apply pesticides according to the label. Misapplication is a violation of the law, and can lead to unnecessary exposure that can threaten the health and safety of occupants, or regulatory fines and lawsuits.

Residual applications (long lasting pesticides)

Precise placement of a suitably labeled, registered and formulated residual chemical insecticide is still a practical bed bug control. Effective insecticide treatments consist of applying interior sprays or dusts to surfaces that bed bugs contact, as well as and to cracks and crevices where they rest and hide. Before using any residual insecticides, care must be taken to select the least-toxic active ingredient and formulation.

Retreatment, when needed, should be carried out after the shortest interval permitted by the label until bed bugs are eliminated. The choice of chemical products and specific application techniques can depend on many factors, including the physical location, product label, the immediate environment, the presence of sensitive populations in the building (including children, elderly and health-compromised individuals) and local, state or national laws.

Crack-and-crevice applications

Because of their habit of hiding clustered together in cracks and narrow hiding spaces, precisely applied crack-and-crevice treatments are among the most effective control techniques against bed bugs.

Active ingredients change over time. There are several products, including those containing multiple ingredients labeled for use against bed bugs. Various formulations and devices are also available for applying insecticides to bed bug-infested areas. For example, dust formulations should be used in electrical outlet boxes and in other places where it is desirable to employ low-risk (low volatility and toxicity), long-lasting insecticides.

Insect Growth Regulators

Insect growth regulators (IGRs) have virtually no effect on vertebrate metabolism because of their mode of action and low application rates, when applied properly, but they very effective against bed bugs, impeding their development and fertility.

Space sprays (ULV, aerosols, and foggers)

Insecticides currently labeled for ULV, aerosols and foggers have little or no residual effects on bed bugs. Most will seldom penetrate into bed bug hiding spaces, and seldom effective at killing bed bugs, even with prolonged or repeated exposure to such products.

Fumigation
While fumigation of furniture, clothing, or other personal items can kill all bed bug stages present, it will not prevent reinfestation immediately after the fumigant dissipate, and is seldom necessary, practical or affordable.

Follow-up

At least one follow-up inspection of infested sites should be conducted at a suitable interval (e.g., 10-21 days) after each control effort or treatment in order to detect any of the typical signs of continued infestation, such as live bugs, cast skins (after those present earlier had been removed), fecal spots on bed linens or harborages, and unhatched eggs.

This guide has been modified and adapted from the Armed Forces Pest Management Board’s Technical Guide No. 44, “Bed Bugs - Importance, Biology, and Control Strategies,” issued August 2006.

References


Resources for Bed Bug Control: Where to Get More Information

Authors: L.J. Pinto, R. Cooper, & S.K. Kraft (2007)  
This is an extensive guide with step-by-step instructions for bed bug prevention and control. It includes checklists for apartments, hotels, dorms, and other sites susceptible to bed bug infestations.

**Entomologist and noted bed bug expert Richard Cooper's website includes "Bed Bugs 101: Information Everyone Should Know About Bed Bugs". It provides extensive information on questions related to bed bug prevention, control, and product recommendations.**

**Harvard School of Public Health**  
http://www.hsph.harvard.edu/bedbugs/  
This document contains basic information about bed bugs and their health significance, as well as methods to safely and effectively control infestations.

**Los Angeles County Department of Public Health**  
http://www.publichealth.lacounty.gov/bedbugs.htm  
Basic information on bed bug control and recommendations for residents and building owners in and around Los Angeles County.

**National Center for Healthy Housing**  
http://www.nchh.org/  
This website contains an extensive 43 page downloadable best practices guide for multi-unit housing. To access it, search for "bed bugs"-one of the results will be "What's Working for Bed Bug Control in Multifamily Housing?"

**New York City’s Bed Bug Report**  
The City of New York’s comprehensive guide overview of the status of bed bugs in New York City, as well as best practices and policy recommendations.

**New York State Integrated Pest Management Program**  
http://www.nysipm.cornell.edu/whats_bugging_you/bed_bugs/  
This website has resources for an IPM approach to bed bugs. Scroll down the page for links to "Bed Bugs are Back! An IPM Answer", FAQs, information cards, and "Guidelines for Prevention and Management of Bed Bugs in Shelters and Group Living Facilities".

**San Francisco Department of Public Health**  
http://www.sfdph.org/dph/EH/Vector/default.asp  
SFDPH’s Environmental Health Section hosts a Vector Control site with information about bed bug management, as well as rules and regulations affecting hotels and multi-unit buildings.

**State of Michigan**  
http://www.michigan.gov/emergingdiseases/0,1607,7-186--147759--,00.html  
The State of Michigan maintains a Bed Bugs Resources list, which includes access to multiple guides and informational fact sheets.

**Toronto Public Health**  
http://www.toronto.ca/health/bedbugs/index.htm  
An extensive list of bed bugs fact sheets for the public as well as landlords and property managers. Their general bed bug fact sheet is available in thirteen languages, including Polish and Arabic.

**University of Kentucky – Entomology**  
http://www.ca.uky.edu/entomology/entfacts/ef636.asp  
This five-page downloadable bed bug guide was written by prominent bed bug researcher Michael Potter. It includes useful pictures and detailed information on habits, bites, hiding places, controlling infestations, and preventing infestations.
Asthma

Asthma is a long-term, inflammatory disease of the lung airways. Symptoms of asthma include wheezing, coughing, feeling of tightness in the chest, difficulty breathing, and itching neck, throat and ears.1

Why Be Concerned?

Approximately 20 million Americans have asthma and it is the most common chronic childhood disease – affecting 6.1 million children nationally.2 A bad asthma attack can be fatal. In urban areas around the country, death rates from asthma are disproportionately high. In fact, the asthma death rate in Chicago has more than doubled in the past 20 years, particularly for African American and Puerto Rican children.3

Asthma Triggers

Asthma attacks are usually caused by inflammation and tightening in the airways of the lungs. This is often caused by exposure to certain substances called triggers. Triggers are either allergens or irritants. Allergens are substances that cause an allergic reaction such as pollen, animal dander, or mold. Irritants can include pesticides, perfume, and cleaning products. Repeated exposure to certain substances (such as mouse allergens) can make people more likely to develop allergic reactions.

“Pests” are unwanted creatures that invade our homes. Most often this means rats, mice, and cockroaches. Once they’ve gotten inside, each of these pests can contribute to an asthma attack – in fact, research is going on to determine whether or not they cause asthma to develop.

A major factor contributing to asthma in urban-dwelling children has been found to be exposure to cockroach allergens.4 Cockroaches shed skin scales, leave behind waste products, and, when cockroaches are dead, their bodies turn into a dust – all things that can trigger an asthma attack. To make matters worse, the pesticide sprays, bombs, and fumigants that are used to control roaches can also cause an attack.5 Rodents can trigger asthma as well. Both rats and mice shed dead skin cells, called dander, that can trigger attacks if someone with asthma breathes them in. Waste products that rodents leave behind can also cause an attack.

Awareness of asthma triggers can help you take steps to reduce them, preventing asthma symptoms or attacks.

Pesticides and Human Health

Pesticides are substances designed to kill, control or repel pests, including insects, rodents, weeds, and molds. Pesticides are listed by the EPA as one of four environmental pollutants that may influence the induction and exacerbation of asthma symptoms.1 Pesticides do this by irritating the lungs as they are breathed in.

If used irresponsibly they can result in serious injury or even death, but even following label instructions doesn’t guarantee safety. Many commonly-used pesticides have been linked to cancer, birth defects, reproductive disorders, and neurological, kidney and liver damage in laboratory animals. A growing body of evidence indicates that children are especially vulnerable. One study found a two to six-fold increase in childhood brain cancer in homes where certain pesticides were used.6 Long-term exposure to low doses of pesticide mixtures has also been linked to increased aggression and damage to immune systems in laboratory animals.7 Clearly, there’s a need for an alternative for people with asthma - as well as everyone else!
What Can You Do?
Integrated Pest Management (IPM) is the best approach to controlling pests like cockroaches and rodents, because it reduces the amount of pests and the pesticides used to control it.

Integrated Pest Management: A Safe, Effective Alternative
Integrated Pest Management is a safe, effective, economical alternative to routine pesticide use. IPM emphasizes prevention and uses knowledge of the pest to identify effective non-chemical methods to control it. As a final resort, less toxic pesticides can be used in tandem with the non-chemical methods to ensure a high level of control. Because IPM focuses on the root causes of pest problems, it is more effective than conventional pest control.

IPM Methods Include:

Monitoring
Sticky traps or glue boards (traps with adhesives that are set out to catch pests), inspections and record keeping of pest sightings helps pinpoint pest problems. The goal is to find out where pests are getting in and where they are nesting, then recording and analyzing that information to choose the best control method.

Control Methods
These methods are at the heart of an IPM program:

- Place steel wool or copper mesh in holes, cracks, or crevices, then caulk or spackle to seal it in. The goal is to prevent pest access, particularly where pipes come in through the wall.
- Reduce clutter - get rid of the things you don't need such as newspapers, magazines, etc.
- Keep dirty dishes in soapy water so that pests can't eat the scraps.
- Clean thoroughly - pay particular attention to the floor under the oven and refrigerator, where food crumbs may be collecting.

Chemical controls: Less Toxic Pesticides
After using all the above methods, you may need to consider using a less toxic pesticide, available as baits for cockroaches, mice and rats. Check your local hardware store for baits that are containerized or in a gel form to prevent people from coming into contact with them.

For more information on IPM, contact Safer Pest Control Project at 773-878-7378.

Sources