

Household Insects

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Improving the sanitation and maintenance in and around the home is the best way to prevent household insect and spider pests. Outdoor clutter and debris that harbor pests should be removed from around the home. Pest entry should be reduced by sealing holes and cracks around plumbing lines and windows. Indoors, proper sanitation, food storage, and waste removal will deprive pests of food and water resources. All of these measures will make the home inhospitable to pests and will limit their survival.

Bat Bugs

Prevention: Bat bugs inside a structure are typically the result of bats or birds roosting in the attic. If the bat bug population becomes very large, bugs will start to become a nuisance inside the home. Frequently, however, bat bugs become a problem after a bird or bat population has been removed from a structure. Bat bugs remaining in the empty roost no longer have a host to feed on so they move into the living space to feed on people. The best way to prevent a bat bug infestation is by eliminating access points around the structure to keep bats or birds from roosting inside. If a population of bats or birds has to be removed from a home, an effort should be made to clean out the nests and droppings (guano) left behind. Cleaning should only be performed while wearing a respirator because of the toxic fungal spores and bacteria associated with bat guano and bird droppings.

Control: Inspect infested rooms thoroughly, starting with electrical connections coming through the ceilings, then around the edges of the carpet, between the floorboards, and in drop ceilings, if applicable. Caulk and seal all openings that would allow bat bugs access to human living space. Vacuum the floors and closets thoroughly. Treat all areas where bat bugs are found with a labeled insecticide. A combination of insecticide products should be used simultaneously. An insect growth regulator combined with a crack and crevice treatment, and a long-term residual insecticide along the baseboards is the best approach. All of these treatments should be applied by a professional.

Bed Bugs

Prevention: Bed bugs are becoming an increasingly serious problem in the United States. Many home infestations result from traveling and staying in hotels (even five-star hotels), motels, and camps or lodges and bringing the bed bugs home in luggage or clothes. To prevent infestations that might result from travel, always inspect the mattress in your sleeping room for signs of bed bug infestation (bugs or blood speckles in the mattress seams and tufts) prior to unpacking or sleeping in the bed. Good sanitation, particularly the removal of clutter, will inhibit bed bug population growth and help to prevent bed bugs from becoming well established. Although bed bug populations cannot be eliminated by sanitation alone, removing clutter will make the environment less hospitable for bed bugs and much easier to treat with insecticides. It is essential that furniture, clothing, boxes, or other personal effects NOT be moved from an infested location to an uninfested location. Moving these items will simply spread the infestation because it is very difficult to determine if an item is free of all immature bed bugs and bed bug eggs. It is also recommended that you not bring other peoples' furniture or belongings into your home unless you know they are bed bug free.

Control in beds and bedding: All bedding needs to be thoroughly cleaned with a strong detergent and dried at a high temperature (150°F) or thrown away. Mattresses can be steam cleaned or washed thoroughly with soap and water and left outside to dry. If washing or steam cleaning is not possible, products that are labeled for mattress treatment can be applied to the mattress to kill the bed bugs. After washing or treating a mattress with an insecticide, it should be encased in a bed bug-proof mattress cover to prevent any surviving bed bugs from getting off the mattress and biting. Encasing the mattress will also prevent it from becoming reinfested with bed bugs still in the room. Box springs are a popular harborage for bed bugs. To treat the box springs, remove and discard the cloth backing to provide access to the inner frame so that you can treat the inside of the wood frame and along the slats and bedsprings with a labeled insecticide. Cover box springs with a bed bug-proof mattress cover after treatment. Inspect the headboard and bed frame for bed bugs and treat with a labeled insecticide.

Control in infested rooms: Inspect the room thoroughly by looking around the edges of the carpet, between the floorboards, behind photos or posters on the wall, along the door frames around closets, inside shoes that are worn infrequently, and in any other crack or crevice where bed bugs can hide. Remove all clothing and place in a sealed plastic bag until it can be laundered. Remove all personal items from closets and drawers, disposing (outside) of all unnecessary items while inspecting and cleaning the rest. Thoroughly vacuum the floors, closets, and drawers. Treat furniture and other areas with a labeled insecticide. It is recommended that a combination of insecticide products be used simultaneously. An insect growth regulator combined with a

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crack and crevice treatment, and a long term residual insecticide along the baseboards is the best approach. The infested location should be treated at least three times at two-week intervals. All of these treatments should be applied by a professional.

Keep in mind that bed bug treatment is very difficult. Most pest management professionals have only recently learned how to treat for bed bugs. Also, there are only a few products labeled for bed bug treatment. There are even fewer low toxicity products that can be applied to mattresses or bedding. Bed bugs are hard to locate, hard to kill, and can live over a year without feeding so sanitation, diligence, and patience are absolutely necessary when attempting to control this pest.

Controlling Insects

Table 6.3 - Recommended Use			
Pests	Prevention	Pesticide	Application
Ants	Eliminate food materials that attract ants into home. Follow good sanitary practices. Perimeter sprays applied by a professional pest control operator will significantly reduce pest entry.	Baits Aerosol sprays Fipronil 0.06 ¹ Imidacloprid 0.05%	For colony control: Identify the type of ant and use a bait labeled for that species. Ants are finicky and may prefer a sweet or a protein-based bait. Indoors: Spray baseboards, cracks, door frames, and window sills.
Asian Lady Beetles	Seal all possible routes of entry, screen vents, and install door sweeps. Vacuum up live lady beetles that make their way indoors and dispose of the bag outdoors.	Micro-cap formulations of lambda-cyhalothrin (Demand CS ¹) work best	Pesticide applications to lady beetle entry points outside of the home need to be made the first week of October to be effective. If lady beetles are already entering the home, pesticide applications will not prevent their entry although they may die once inside.
Bat Bugs	The best way to prevent a bat bug infestation is by eliminating access points around the structure to keep bats or birds from roosting inside. Bat bugs can become a problem after a bird or bat population has been removed from a structure. Bat bugs remaining in the empty roost no longer have a host to feed on so they move into the living space to feed on people. See previous page for more information.	Professional-use Residual Products Baseboard sprays: Pyrethroids (Bifenthrin 0.06%, Deltamethrin 0.06%, Lambda Cyhalothrin 0.5%); Insect Growth Regulator (Hydoprene 0.36%) Crack and crevice: Pyrethroids (Bifenthrin 0.06%, Deltamethrin 0.06%, Lambda Cyhalothrin 0.5%); Insect Growth Regulator (Hydoprene 0.36%)	All of these treatments should be applied by a professional. Treat all areas where bat bugs are found with a labeled insecticide. A combination of insecticide products should be used simultaneously. An insect growth regulator combined with a crack and crevice treatment, and a long-term residual insecticide along the baseboards is the best approach.

¹Professional Use
²Professional Use Outdoors
³Home Use

Table 6.3 - Recommended Use (cont.)

Pests	Prevention	Pesticide	Application
Bed Bugs	Although bed bugs cannot be eliminated by sanitation alone, removing clutter will make the environment less hospitable for bed bugs and much easier to treat with insecticides. It is essential that furniture, clothing, boxes, or other personal effects NOT be moved from an infested location to an uninfested location. Moving these items will simply spread the infestation as it is very difficult to determine if an item is free of all immature bed bugs and bed bug eggs. See previous page for more information.	<p>Mattress sprays: Steri-Fab (isopropyl alcohol 60%), Deltamethrin (0.06%); d-Phenothrin (0.40%)</p> <p>Professional-use Residual Products</p> <p>Baseboard sprays: Pyrethroids (Bifenthrin 0.06%, Deltamethrin 0.06%, Lambda Cyhalothrin 0.5%); Insect Growth Regulator (Hydoprene 0.36%)</p> <p>Crack and crevice: Pyrethroids (Bifenthrin 0.06%, Deltamethrin 0.06%, Lambda Cyhalothrin 0.5%); Insect Growth Regulator (Hydoprene 0.36%)</p>	At this time, there is no single control method for bed bugs that will eliminate an infestation. Bed bug treatment requires a variety of non-toxic (to humans and pets) and low-toxicity insecticide products be applied to infested rooms. These treatments will need to be applied multiple times, and at regular intervals.
Boxelder Bugs	Collect in vacuum cleaner or by broom and dust pan, and destroy. Plug openings in window sashes to prevent entry. Caulk cracks, etc. Spray only in areas inaccessible to children and pets.	Residual: Pyrethroid formulations Lambda-Cyhalothrin ¹ (6 ml/gal) Wettable powder Microencapsulation	<p>Indoors: Vacuum individual insects when they appear.</p> <p>Outdoors: Apply preventative residual barrier mid to late August.</p>
Carpet Beetles	Follow good housekeeping practices. Clothing should be thoroughly brushed and hung outside in the sunlight. Dry cleaning kills these pests. Clean hot air registers and cold air ducts. Use vacuum cleaner regularly. Frequently remove and destroy disposable vacuum cleaner bag. Never allow clothing, rugs, etc., to lie in a pile neglected over a period of time.	Preventative: Naphthalene Residual: Pyrethroid microencapsulation or wettable powder Cypermethrin ¹ 0.0150-0.03% ¹	<p>Indoors: Treat rugs and carpets including baseboards evenly and lightly in areas of infestations. Store only previously cleaned clothing, etc., in air-tight closets or containers.</p> <p>Outdoors: Apply residual formulation to outside surfaces during the autumn season.</p>
Clothes Moths	Follow good housekeeping practices. Clothing should be thoroughly brushed and hung outside in the sunlight. Dry cleaning kills these pests. Prevent lint and dust from accumulating. Clean hot air registers and cold air ducts. Use vacuum cleaner regularly. Frequently remove and destroy disposable vacuum cleaner bag. Never allow clothing, rugs, etc., to lie in a pile neglected.	Preventative: Naphthalene	<p>Indoors: Store only previously cleaned clothing in air-tight closets and containers. Clothing may be protected by using a ready-to-use pressurized container or insecticide recommended for this purpose. Use moth crystals, balls, or flakes in garment bags and closets where clothes are kept. Replace periodically.</p>

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Pests	Prevention	Pesticide	Application
Clover Mites	Indoors: Clover mites should be removed with a vacuum to reduce red smears and stains. Outdoors: A 5-ft band of bare soil around the foundation will discourage mite infestation.	Aerosol sprays Permethrin 0.25% Tralomethrin 0.03% Lamda-Cyhalothrin ² microencapsulation 0.015-0.03% Cypermethrin ² Wettable powder	Indoors: Direct spray onto mites in cracks and other areas where they hide. Outdoors: Prepare a 5 ft wide strip of bare soil next to the house foundation the first week of May. Apply to the bare soil as a barrier completely around the house. Spray house 2 ft up from foundation siding and soil out 6 inches to 1.0 ft from foundation.
Cluster Flies	Seal all possible routes of entry, screen vents, and install door sweeps. Vacuum or trap flies with light traps or sticky traps.	Cypermethrin ¹ 25.3% Perimeter Spray	Early autumn application should be made to the perimeter of the structure to prevent adult fly entry.
Cockroaches Or Waterbugs	Using a vacuum is ideal for removing cockroaches and their debris when doing the initial clean out. Sticky traps can be used to monitor cockroach populations and detect infestations. Increasing sanitation will also prevent cockroaches from becoming established.	Gel Baits Bait Stations Boric Acid Powder Aerosol Sprays	Indoors: Apply in cracks and crevices and in other out-of-sight areas. Treat areas where pipes go through walls or floors. Treat cockroach runways under sinks and behind appliances. Place bait in cracks and crevices where cockroaches hide.
Crickets	Eliminate moist harborage areas near structures. Crawl spaces should be ventilated and dry. Entry points should be sealed.	Indoors: Aerosol sprays Outdoors: Permethrin ³ 0.25% Bifenthrin ³ 0.05% Microencapsulated formulations (Demand CS) ² Wettable powder formulations (Demon WP) ²	Indoors: Use aerosol to knock-down and kill individual crickets. Outdoors: Spray windows, doorways, and other entry sites. Apply to foundation walls, window wells, subfloor crawl spaces, under garbage cans, at door thresholds, etc.
Drain Flies	Sanitation is the best control measure. Clean away the gelatinous film from drains and sinks; clean garbage containers regularly. Do not allow wet lint to accumulate under washing machines. Avoid moist organic debris of any nature, especially in the basement.	Aerosol sprays Drain cleaners: Drain Gel Micro Foam	Indoors: Use aerosol for adult fly control. For control of fly larvae in infested drains, use a drain treatment product to eliminate these breeding sites. Most over-the-counter drain cleaners will kill the larvae when used with very hot water.

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Table 6.3 - Recommended Use (cont.)

Pests	Prevention	Pesticide	Application
Earwig	Remove excessive clutter from the ground around outside of house. Items such as tarps, boards, and firewood provide harborage for earwigs. Bait areas where earwigs are found most commonly. If a number of earwigs are found aggregating indoors, remove them with a vacuum and clean the area with soap and water. Cleaning will remove the pheromone chemicals that will attract other earwigs.	Baits Carbaryl 5% Bug and Snail Bait	Remove all mulch, plant debris, and organic material from around foundation to reduce moisture.
Fleas	Spot-on treatments for pets are by far the most effective way of eliminating fleas. Regular applications (1/mo) will often eliminate indoor flea problems.	Spot-on treatment, available at local animal clinics, like fipronil (Frontline) or imidacloprid (Advantage); Insect growth regulators (Nylar) (Precor); Aerosol Foggers	Indoors: Apply insect growth regulators to carpets in rooms where a flea infestation is apparent. Spray animal's sleeping quarters and replace old bedding with clean, fresh, untreated bedding. Aerosol foggers kill adult fleas indoors. Outdoors: Treat infested areas of lawn, under dog houses (thoroughly clean the inside of dog houses regularly), and under porches with insect growth regulator.
Flies	Good sanitation and tight screens and garbage can lids are sound preventive control measures. Use of fly swatter is still practical. Do not contaminate food or utensils with insecticides.	Residual formulations: Microencapsulated or Wetable powder	Indoors: Use an aerosol spray in the air when flies are present. Outdoors: Apply to walls adjacent to dumpsters or other breeding sites. Light traps used outdoors will catch flies. But they also may attract flies in from other areas.
Flour, Grain Beetles	Discard infested foods and keep uninfested food in tightly-fitting-lid containers.	None	Indoors: First, thoroughly clean infested shelves. Cover shelves with clean, fresh shelf paper or foil.
Long-horned Beetle	These beetles frequently hitchhike into the home via firewood. It is wise to store firewood outdoors to prevent beetle emergence in the home. Also see: Old House Borer, pg. 157	None	Indoors: Usually, individual beetles can simply be picked up with a vacuum cleaner and then the cleaner bag contents discarded.

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Pests	Prevention	Pesticide	Application
Millipedes	Millipedes that stray into the home can be picked up with vacuum, or they can be collected with a broom and dust pan, and discarded. Outdoors: Remove sources of moisture such as excessive mulch, decaying grass, leaves, etc., from around the house foundation. Double-sided tape placed along entry ways can limit access into the structure.	Cypermethrin ¹ 25.3-40.0% Microencapsulations Wettable powder Dusts in drier areas	Indoors: Use aerosol sprays on individual millipedes. Outdoors: Spraying pest entry sites may help but outdoor applications during a mass millipede migration will do little to stop their numbers.
Mosquitoes	Maintain good, tight-fitting screens on windows and doors. Remove or frequently empty any containers from premises that may hold rainwater. Clean out clogged roof gutters holding stagnant water. Backyard garden ponds can be stocked with predatory fish that feed on mosquito larvae.	Aerosol sprays Repellents for personal protection	Indoors: Use aerosol spray according to label directions. Repellent: Use Deet or ethyl hexanediol aerosol according to directions. Outdoors: Homeowner applications of mosquito control measures outdoors are discouraged due to concerns over water contamination and the impact on non-target animals.
Pantry and Stored-food Pests	Either destroy the infested products, or salvage them by superheating in an oven at 130°F for 1/2 hour, or super-cooling by placing in a deep freeze at 0°F for 4 days. Store insect-free foods in containers with tight lids.	None Aerosol sprays Boric acid dust	Indoors: Remove all items from infested location and thoroughly clean shelves. Labeled insecticide may be sprayed into cracks and crevices. Cover shelves with clean, fresh paper or foil before placing packages or food in the cupboard.
Silverfish	Remove potential sources of food and moisture. Seal cracks and crevices. Remove books, papers, and boxes that have been stored for long periods.	Residual formulations: Microencapsulation or Wettable powder	Infestations tend to be localized. Apply treatment to suspected harborage areas. Habitat modification can greatly enhance control.
Sowbugs	Reduce or eliminate moist areas around the home. Remove leaf piles, grass clippings, old boards, and excess ground cover. Caulk cracks around home foundations.	Insecticidal dusts	Indoors: Use a spray along doorways, basement windows, and other places of entry.

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Pests	Prevention	Pesticide	Application
Spiders	Spiders can be successfully kept out of the house by careful screening, secure caulking, etc. Practically all spiders in Virginia are harmless. Exceptions are the black widow and brown recluse spiders, which are poisonous.	Repellents for personal protection. Microencapsulations and wettable powder formulations for treating surfaces.	Indoors: Remove spiders, egg sacs, and webs with a vacuum. Seal and dispose of the bag immediately. Appropriately labeled dusts may be used if desired. Outdoors: Remove clutter and debris in the yard where spiders can hide. Turn off outdoor lights at night. Lights attract insects that spiders use as food.
Ticks	Keep grass cut to 3 in or less. Trim vegetation along yard edges, paths, and trails. Remove garbage and wood piles to discourage rodent activity.	5.0% Sevin dust pyrethroid sprays	Outdoors: Treat perimeter and under dog houses. Applications to large outdoor areas are impractical because ticks are often concentrated in spot locations.
Wasps and Hornets	Remove nest when no activity is observed.	Aerosol sprays Wasp and hornet killer	Outdoors: Locate nest entrance during the day. Treat nest at night when most wasps are inside. Wear protective clothing.

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