

# Cockroaches

**Cockroaches thrive in warm environments that provide food, water, and shelter.** Roaches hide in cracks, crawl spaces, and other dark places during the day and come out at night to feed. Pesticide sprays alone will not control roaches and are not usually required. Baits provide better control. You must integrate several strategies to make your home a less roach-friendly environment. Thoroughness is essential for effective control.

## Identify your cockroach species first:

- ◆ Effective management options vary according to species.
- ◆ Cockroach traps provide an easy way to catch roaches for identification.
- ◆ Control practices for outdoor invaders (American, oriental roaches) and indoor residents (brown-banded and German roaches) differ.
- ◆ For help with identification go to [www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu)

## Remove food and water sources:

- ◆ Even tiny crumbs or liquids in cracks provide good food sources.
- ◆ Store food in sealed containers.
- ◆ Keep trash in containers with tight lids.
- ◆ Eliminate plumbing leaks.
- ◆ Vacuum cracks and crevices and clean floors and counters daily.

## Remove roach hiding places:

- ◆ Seal cracks and other openings to prevent invaders from the outside.
- ◆ Seal cracks in false bottoms of cupboards and other indoor hiding places.
- ◆ Seal or clean up other areas where you find roaches or their egg cases hiding.
- ◆ Remove old newspapers, boxes and other clutter in kitchens and bathrooms.
- ◆ The oriental cockroach hides outdoors under ivy and other shelter. Check to see if you have this roach and remove outdoor hiding places or bait.



## Use traps to identify and track cockroach populations:

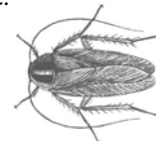
- ◆ Cockroach traps are available in hardware stores.
- ◆ Place traps on the floor around edges of walls, in cupboards and other places where you think roaches are foraging. Place bait stations at locations where you trap roaches.
- ◆ Check traps daily.
- ◆ Sticky traps with pheromones may provide some control of German cockroaches.

## Using chemicals to control cockroaches:

- ◆ Avoid use of foggers, bombs or aerosol sprays — they just disperse populations.
- ◆ Boric acid powder blown into cracks, crevices, hollow walls, under refrigerators, or other undisturbed hiding places is very effective (allow 7 days or more for an effect to be seen).
- ◆ Bait stations containing boric acid, abamectin, fipronil, or hydramethylnon placed near hiding places can be effective if other food sources are removed (allow 7 days or more for an effect to be seen). Replace stations as needed as long as roaches are being caught.
- ◆ Insecticide sprays alone do not give long term control alone. They are not necessary if other methods such as baits and boric acid powder are combined along with cleanup and removal of hiding places.
- ◆ Contact a professional pest control operator for very serious infestations, but be sure they use an integrated program as described above.



German cockroach nymph



German cockroach adult

**Be sure to read product labels carefully and follow all instructions on proper use, storage, and disposal of pesticides.**

For more information about managing pests, contact your **University of California Cooperative Extension office** listed under the county government pages of your phone book or the UCIPM Web Site at [www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu).



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# Rats

**Rats are some of the most troublesome and damaging rodents.** They eat and contaminate food, garden produce, and fruit as well as transmit diseases to humans and pets. Manage them by removing food and shelter, eliminating entryways into buildings, and trapping.

## Indications of a rat infestation:

- ◆ Rat droppings in garages, storage buildings, attics, or around pet food containers
- ◆ Rodent feeding damage on fruit/nuts in or falling from trees in your yard
- ◆ Rat nests behind boxes, in drawers in the garage, or in woodpiles
- ◆ Burrows beneath the garbage can, compost pile, or among garden plants
- ◆ Rats travelling along utility lines or on fence tops at dusk

## Identify the rat: Is it a roof rat or a Norway rat?

- ◆ Norway rats are stocky rats that build burrows along building foundations, beneath rubbish, or in woodpiles. Indoors they tend to remain in basements or on the ground floor.
- ◆ Roof rats are agile climbers with a tail that is longer than their head and body. They usually live and nest above ground in shrubs, trees, or dense vegetation. Indoors they favor attic spaces, walls, false ceilings, and cabinets.

## To get rid of rats, remove food, water, and shelter, and seal entryways!

- ◆ Feed pets only the amount of food they will eat at a single feeding.
- ◆ Keep garbage, trash, and garden debris in receptacles with tight-fitting lids.
- ◆ Thin dense vegetation and create at least a 2-foot space between shrubs and between shrubs and buildings.
- ◆ Thin or remove climbing hedges from buildings.
- ◆ Remove tree limbs that are within 3 feet of a roof.
- ◆ Seal all cracks and openings in the house's foundation that are larger than 1/4 inch.
- ◆ Make sure doors, windows, and screens fit tightly.



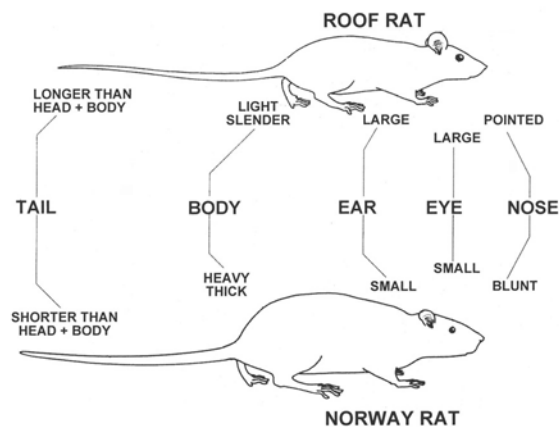
## Remove rats from the home by trapping.

- ◆ Snap traps are the safest, most effective, and economical way to trap rats.
- ◆ For Norway rats, place traps close to walls, behind objects, in dark corners, and in places where rat droppings have been found.
- ◆ For roof rats, place traps in off-the-ground locations such as on ledges, shelves, branches, fences, pipes, or overhead beams.

## What about baits?

- ◆ Avoid using baits indoors because dead rats create bad odors.
- ◆ Seal buildings before baiting outdoors to prevent poisoned rats from coming indoors to die.
- ◆ Place baits in tamper-proof bait stations and secure them from children and pets.
- ◆ All rodent baits are toxic to pets.

Refer to **Pest Notes: Rats** at [www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu) for more details on rat management.



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# House Mouse

**House mice are well-adapted to living in close contact with humans and thrive where food and shelter are abundant.** They eat and contaminate food supplies and can also transmit disease. Their gnawing activities may damage structures or property. Manage them by cleaning up debris, removing food and shelter, eliminating entryways into buildings, or using traps or baits. High frequency electronic devices are not effective.

## How to detect a house mouse infestation:

- ◆ Look for droppings, fresh gnaw marks, and tracks, which indicate areas where mice are active.
- ◆ Search behind boxes, in drawers, in garages, or around woodpiles for nests made of fine shredded paper or other fibrous material.
- ◆ Check for the musky odor associated with mice.
- ◆ Mice are most active at night, but they may be seen during daylight hours.

## Discourage mice by removing food, water, and shelter and sealing entryways.

- ◆ Good housekeeping within buildings reduces shelter and food for house mice.
- ◆ Seal all structural cracks and openings larger than ¼ inch. Use wire screen or coarse steel wool that mice can't chew through.
- ◆ Ensure all doors, windows, and screens fit tightly.
- ◆ Feed pets only the amount of food they will eat at a single feeding.
- ◆ Keep all food storage and garbage containers sealed.
- ◆ Thin or remove plants next to or climbing up buildings since house mice are excellent climbers.

## Remove mice from your home by trapping.

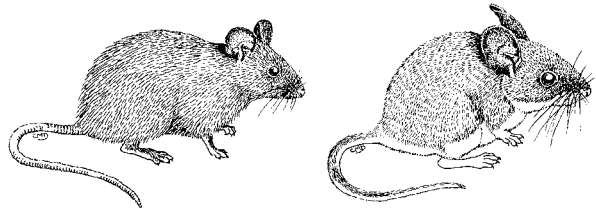
- ◆ Snap traps and glue boards are the safest and most economical traps.
- ◆ Place traps in secluded areas along walls, behind objects, in dark corners, and in places where droppings have been found.
- ◆ Dispose of dead rodents by burying or placing them in plastic bags and putting them in the garbage. Do not touch mice with your bare hands, and wash hands thoroughly after handling traps.



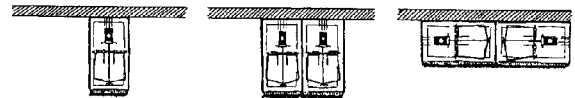
## What about poison baits?

- ◆ Avoid using baits indoors. Mice can die in hidden places, create bad odors, and be difficult to locate. Seal buildings before baiting outdoors to prevent mice coming indoors to die.
- ◆ Baits generally take several days for effective control.
- ◆ Place baits in tamper-proof bait stations out of reach of children and pets—all rodent baits are toxic.

See Pest Notes: House Mouse at [www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu) for complete instructions on carrying out these practices.



The house mouse has almost no hair on its tail and no white markings (left). The carrier of the deadly hantavirus, the deer mouse, has a white underside, more hair on its tail, and is rare in homes (right).



Set traps with trigger next to the wall. Increase your chance of success by setting two.

Minimize the use of pesticides that pollute our waterways. Use nonchemical alternatives or less toxic pesticide products whenever possible. Read product labels carefully and follow instructions on proper use, storage, and disposal.

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# Ants

**Although ants are annoying when they come indoors, they can be beneficial by feeding on fleas, termites, and other pests in the garden.**

While spraying chemicals inside the house may seem effective, it won't prevent more ants from entering your home because most ants live outdoors. Instead, focus efforts on excluding ants from entering buildings. Combine several methods such as caulking entryways, cleaning up food sources, and baiting when necessary. Avoid the use of pyrethroids (eg. bifenthrin and cypermethrin) especially on hard surfaces such as driveways, sidewalks, or around the foundation of buildings. These products pollute waterways.

## Make your house less attractive to ants.

- ◆ **Caulk cracks and crevices that provide entry into the house.**
- ◆ **Store attractive food in closed containers.**
- ◆ **Clean up grease and spills.**
- ◆ **Ant-proof kitchen garbage pails with sticky barriers such as petroleum jelly under the lip and place pet dishes in a moat of water.**
- ◆ **Remove or manage sweet food sources next to your house such as aphid-infested bushes and ripened fruit on trees.**
- ◆ **Keep plants, grass, and organic mulch at least a foot away from the foundation of buildings to reduce ant foraging and nesting.**

## When ants invade your house:

- ◆ **Sponge-up invading ants with soapy water as soon as they enter.**
- ◆ **Plug up ant entryways with caulk.**
- ◆ **Take infested potted plants outdoors and submerge pots in a solution of insecticidal soap and water.**
- ◆ **Clean up food sources by wiping up spills or placing food in tight-fitting containers.**
- ◆ **Rely on outdoor baits to control the ant colony.**
- ◆ **Insecticide sprays should not be necessary.**
- ◆ **If you hire a pest control company, ask them to use baits rather than perimeter treatments or monthly sprays.**



## How baits work:

Pesticide baits attract worker ants so they will take it back to the nest where the entire colony, including queens, may be killed. The pesticide must be slow acting so workers won't be killed before they get back to the nest.

## How to use baits

Place baits near ant trails and nest openings. Pre-packaged or refillable bait stations or stakes are safest and easiest to use. Active ingredients in baits may include boric acid/borate, fipronil, avermectin, sulfluramid, hydramethylnon, or arsenic trioxide. Replace baits when empty and reposition them, or try a different bait product if ants don't appear to be taking it. It may take 5 to 10 days to see fewer ants.

**For more information, refer to the Pest Notes: Ants at [www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu).**



Actual size  $1/8$  of an inch.

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# Fleas

**Fleas are particularly annoying to people and pets, especially during spring and early summer when their numbers tend to increase dramatically.** The common flea in California is the cat flea. Despite its name, it attacks both dogs and cats and will also bite humans. To keep fleas out of your home, control fleas on your pet and regularly clean pet sleeping areas.

## On the pet:

Recently, a number of very effective and safe new products for flea control on the pet have become available. Remember to supplement pet treatments with regular cleaning of your home and periodic combing with a pet flea comb to detect new infestations.

- ◆ Spot-on formulations are applied to the animal's coat, providing flea control for 1 to 3 months. Available from veterinarians or over-the-counter.
- ◆ Systemic flea control products, available from vets, are given as a pill or food additive. While they do not kill adult fleas, they prevent reproduction.
- ◆ Flea collars containing insect growth regulators (IGRs) give protection for up to 6 months on dogs and up to a year on cats. Be sure to choose collars containing methoprene or pyriproxyfen.
- ◆ Flea shampoos and soaps, powders and dusts, spray-on liquids, and dips are less effective and more hazardous to pets, people, and the environment than the three types of products above.

## In the yard:

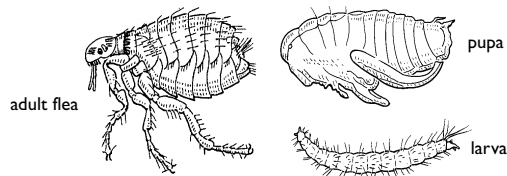
Outdoor treatment is rarely needed, but if your pet regularly sleeps outside and flea numbers are high, these areas can be treated with a spray containing pyriproxyfen. If possible, open sleeping areas to sunlight by removing low hanging vegetation. Immature fleas are unlikely to survive in areas with exposure to sunlight.



## Inside the home:

Whether or not you are aware of fleas in your home, regularly vacuum and launder areas where your pet rests to avoid flea buildup. If you have a major flea problem, treat your pet with one of the options on the front of this card and follow the steps below.

- ◆ Locate heavily infested areas (usually areas where the pet rests) and concentrate treatment there.
- ◆ Wash throw rugs and pet bedding.
- ◆ Vacuum upholstered furniture, cleaning under cushions and in crevices.
- ◆ Vacuum carpets, especially beneath furniture.
- ◆ Use a hand sprayer or aerosol to treat all carpets and unwashable upholstered furniture with an insecticide that contains an IGR (methoprene or pyriproxyfen). This treatment kills larvae but not pupae, so fleas may continue to emerge for up to 2 weeks.
- ◆ Over the next two weeks vacuum regularly to remove adult fleas that emerge from pupae. Do not reapply pesticides.
- ◆ Seal vacuum bags and discard them so fleas don't escape.



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# Yellowjackets

## Yellowjacket wasps prey on other insects and also scavenge on human food and garbage.

Yellowjackets defend their nests with stings, like other social wasps and bees, but also are more likely to sting if disturbed while foraging. Stings generally cause pain and short term injury, but some people suffer severe allergic responses. Prevent injury by avoiding wasps and removing food sources. Populations may be reduced by trapping or nest treatment. Pesticides other than nest treatments are usually ineffective.

### Make sure it's a yellowjacket.

- ◆ Yellowjackets are ½ to 1 inch long, with jagged bright yellow and dark black stripes. Their narrow “waist” is barely visible. Other common wasps do not scavenge on food. Yellowjackets nest in holes in the ground, inside wall cavities, or in hanging nests enclosed in grey paper.
- ◆ Honeybees are less brightly striped than yellowjackets, and are hairier. Usually they aren't attracted to food (sometimes to sweets) and are unlikely to sting unless trapped or stepped on. They usually nest inside of cavities in trees or houses.
- ◆ Paper wasps have long slender waists, build open paper nests under eaves, and are rarely aggressive.
- ◆ Mud daubers are dark-colored and thread-waisted, build small hard mud nests, and rarely sting.

### Keep your cool to avoid stings.

- ◆ If a wasp lands on you, don't swat it or run. Wait for it to leave, or gently brush it away.
- ◆ Do not disturb nests. Wasps flying from a hole in the ground or a building indicate a probable nest.

### Remove attractive food sources.

- ◆ Keep foods, including pet food, covered or indoors.
- ◆ Cover sugary drinks when outdoors. Yellowjackets may crawl into soda cans.
- ◆ Keep garbage in sealed cans and empty regularly.
- ◆ Pick up and dispose of ripe fruit.



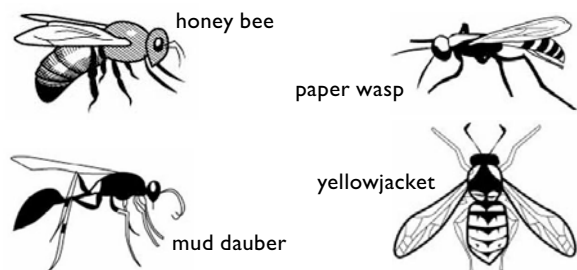
### Use traps to reduce yellowjacket numbers in local areas.

- ◆ Hang yellowjacket lure traps out in spring to catch nesting queens. Traps may reduce but not eliminate populations and work only on some species.
- ◆ Make a homemade water trap with a meat bait hung on a string just above soapy water.
- ◆ Place traps a distance away from areas, such as picnic tables, where people congregate.

### To protect yourself and your family, consider calling a professional if you find nests.

- ◆ Ask your Mosquito and Vector Control District if they treat nests or locate a licensed pest control operator in your phone book.
- ◆ If you choose to treat nests yourself, wear protective clothing on your body, hands, and head. Use an insecticide that shoots a long stream into the nest entrance.
- ◆ Nests may be far away and impossible to locate.
- ◆ Paper wasp nests should not require treatment unless they are located near human passageways.

Check out our Web site at [www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu) for more details on yellowjackets and wasp and bee stings.



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# STOP BED BUGS SAFELY

## WHAT ARE BED BUGS?

Bed bugs are small insects that feed on human blood. They are usually active at night when people are sleeping. Adult bed bugs have flat, rusty-red-colored oval bodies. About the size of an apple seed, they are big enough to be easily seen, but often hide in cracks in furniture, floors, or walls. When bed bugs feed, their bodies swell and become brighter red. They can live for several months without food or water.

## WHAT DOES A BED BUG BITE FEEL AND LOOK LIKE?

Most bed bug bites are initially painless, but later turn into large, itchy skin welts. These welts do *not* have a red spot in the center like flea bites.

## ARE BED BUGS DANGEROUS?

Although bed bugs are a nuisance, they are not known to spread disease.

## HOW DOES A HOME BECOME INFESTED WITH BED BUGS?

In most cases, people carry bed bugs into their homes unknowingly, in infested luggage, furniture, bedding, or clothing. Bed bugs may also travel between apartments through small crevices and cracks in walls and floors.

## HOW DO I KNOW IF MY HOME IS INFESTED WITH BED BUGS?

You may notice itchy skin welts. You may also see the bed bugs themselves, small bloodstains from crushed insects, or dark spots from their droppings. It is often hard to see them because they hide in or near beds, other furniture, and in cracks.

## HOW CAN I GET RID OF BED BUGS?

The Health Department recommends that homeowners hire pest control professionals licensed by the New York State Department of Environmental Conservation (DEC) to get rid of bed bugs.

The pest control company should:

- Inspect your home to confirm the presence of bed bugs.
- Find and eliminate their hiding places.
- Treat your home with special cleaning and/or pesticides if necessary.
- Make return visits to make sure bed bugs are gone.

Be sure you hire a licensed exterminator. Ask to see a copy of the license or check directly with DEC by calling (718) 482-4994 or visiting <http://www.dec.state.ny.us/website/dshm/pesticid/appman.htm>

## IS IT NECESSARY TO USE PESTICIDES TO GET RID OF BED BUGS?

The best way to get rid of bed bugs is to clean, disinfect and eliminate their hiding places. Since bed bugs can live for several months without food and water, pest control professionals may use a pesticide. Talk with the professional about safe use of pesticides and make sure he/she:

- Uses the least toxic pesticide.
- Follows instructions and warnings on product labels.
- Advises you about staying out of treated rooms and when it is safe to reenter.
- Treats mattresses and sofas by applying small amounts of pesticides on seams only. Pesticides should **never** be sprayed on top of mattresses or sofas.



Actual size

Michael F. Potter, University of Kentucky ©2004

## HOW CAN I GET RID OF BED BUGS?

### 1. Find out where bed bugs are hiding in your home.

Use a bright flashlight to look for bed bugs or their dark droppings in bedroom furniture. Or use a hot hair dryer to force them out of hiding spaces and cracks. Check:

- Behind your headboard.
- In the seams and tufts of your mattress and inside the box spring.
- Along bedroom baseboard cracks.
- In and around nightstands.
- Other bedroom items, including window and door casings, pictures, moldings, nearby furniture, loose wallpaper, cracks in plaster and partitions, and clutter.

### 2. Clean areas where bed bugs are likely to hide.

- Clean bedding, linens, curtains, rugs, carpets, and clothes. To kill bed bugs, wash items in hot water and dry them on the highest dryer setting. Soak delicate clothes in warm water with lots of laundry soap for several hours before rinsing.
- Scrub mattress seams with a stiff brush to dislodge bed bugs and their eggs.
- Vacuum mattresses, bed frames, nearby furniture, floors and carpets. Pay special attention to cracks and open spaces. Immediately after vacuuming, put the vacuum cleaner bag in a sealed plastic bag, and dispose of it in an outdoor container.
- If you find bed bugs on a mattress, cover it with a waterproof, zippered mattress cover labeled “allergen rated,” or “for dust mites.” Keep the cover on for at least one year.
- If your box spring is infested, seal it inside a vinyl box spring cover for at least one year. If no cover is available, throw the box spring away.
- Dispose of infested items or clutter that can't be cleaned. Seal tightly in a plastic garbage bag and discard in an outside container.
- Repair cracks in plaster and loose wallpaper.

### 3. Be very cautious about using pesticides yourself.

Pesticides can be hazardous to people and pets. If you choose to use a pesticide, or a licensed exterminator suggests you use one, follow these precautions:

- Only use pesticides clearly labeled for bed bug extermination. Never use a cockroach spray, ant spray, or any other pesticide that does not list bed bugs on the label.
- Follow label instructions exactly.
- Never spray pesticides on top of mattresses or sofas, or in areas where children are present.
- Never purchase or use a product without a manufacturer's label and never buy pesticides from street vendors.
- Avoid “insecticide bombs” and “foggers” in your home. These products can spread hazardous chemicals throughout your home.

## HOW CAN I KEEP BED BUGS OUT OF MY HOME?

- Wash clothing and bedding immediately after returning from a trip.
- Inspect used furniture for bed bugs before bringing it into your home.
- Never bring discarded bed frames, mattresses, box springs, or upholstered furniture into your home.

## HOW CAN I KEEP MY FURNITURE FROM INFESTING SOMEONE ELSE'S HOME?

- Never resell or donate infested furniture.
- If you throw infested furniture away, make it undesirable to others by cutting or poking holes in its upholstery or making it unusable. Tape a sign to it that says, “Infested with Bed Bugs.”

This fact sheet is available at [nyc.gov/health](http://nyc.gov/health). For more copies, call 311 and ask for “Stop Bed Bugs Safely.”