

Ants

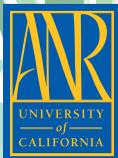
Although ants are annoying when they come indoors, they can be beneficial by feeding on fleas, termites, and other pests in the garden. While spraying chemicals inside the house may seem effective, it won't prevent more ants from entering your home, because most ants live outdoors. Instead, focus efforts 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 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 and 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.**



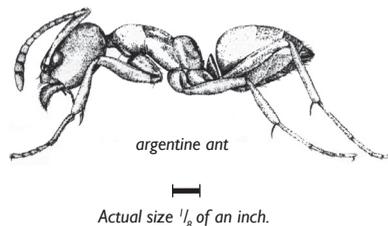
How baits work:

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. Prepackaged 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.



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Bed Bugs

Bed bugs are small, wingless insects that can feed on sleeping humans at night. These nocturnal insects hide along seams of mattresses, in box springs, or in cracks and crevices near sleeping areas. Eliminating an infestation requires removing or treating all infested material and monitoring to be sure bed bugs are gone.

Bed bug identification and biology

- ◆ **Adults are small (about 1/5 inch), oval, and rusty red. Nymphs, or immature bed bugs, are smaller and lighter colored.**
- ◆ **Bed bugs feed only on blood and must have one blood meal prior to molting to the next, larger nymphal stage.**
- ◆ **Adults can feed every few days but can survive many months without food.**

What are associated health problems?

- ◆ **Bed bug feeding is painless. Victims usually remain asleep.**
- ◆ **Areas around bites may redden, swell, and itch. Some people have no reaction.**
- ◆ **Bed bugs are not known to spread diseases, but scratching bites can lead to infections.**

How does a bed bug infestation start?

- ◆ **People can carry bed bugs on luggage, clothes, bedding, furniture, or other objects and may pick them up in hotels.**
- ◆ **Hotels, homeless shelters, furnished apartments, and dormitories are most at risk.**
- ◆ **Second-hand mattresses and furniture can be a source.**

Detecting bed bugs.

- ◆ **Look for bed bugs, their dark fecal spots, and light-brown shed skins.**
- ◆ **Focus on mattresses, box springs, bed frames, and areas around the bed.**
- ◆ **Bed bugs like to hide. Remove bedding. Look in cracks, crevices, and holes. Turn furniture upside down and dismantle frames if necessary.**
- ◆ **Use a flashlight and magnifying glass.**

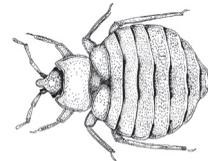


Remove or treat all infested materials as soon as you detect bed bugs.

- ◆ **Vacuum along mattress seams, baseboards, and other areas.**
- ◆ **Wash all bedding and clothing in hot (120°F) water and dry in a hot dryer.**
- ◆ **Consider steam cleaning.**
- ◆ **If possible, replace infested mattresses.**
- ◆ **Specially-designed mattress encasements may be helpful.**

Serious infestations may require insecticide treatment.

- ◆ **Hire an experienced pest control professional. They have access to the most effective products.**
- ◆ **Apply insecticides to cracks, crevices, baseboards, and bed frames but not directly to mattresses or bedding. Use special dusts for wall voids and other out-of-the-way spots.**
- ◆ **Insecticides alone will not control bed bugs. Remove infested materials, and seal hiding spots.**
- ◆ **Inspect after treatment to be sure bugs are gone.**



Adult bed bug (1/5 inch).

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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 (brownbanded, German roaches) differ.
- ◆ For help with identification, go to 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 use bait.

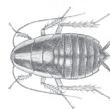


Use traps to identify and track populations:

- ◆ 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 using 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 to see an effect.)
- ◆ Bait stations containing boric acid, abamectin, fipronil, or hydramethylnon placed near hiding places can be effective if you remove other food sources. (Allow 7 days or more to see an effect.) Replace stations as needed as long as they are catching roaches.
- ◆ Insecticide sprays alone don't give long-term control. They aren't necessary if other methods such as baits and boric acid powder are combined with cleaning up and removing 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

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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 homes is the cat flea. Despite its name, it attacks both dogs and cats and also will bite humans. To keep fleas out of your home, control fleas on your pet and regularly clean pet sleeping areas.

On the pet:

Systemic flea control materials applied on the pet or in food are very effective. 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:

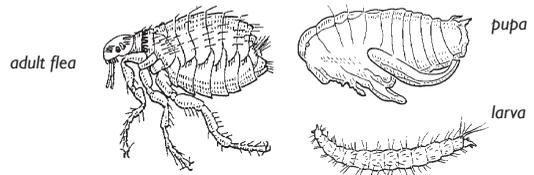
Outdoor treatment is rarely needed, but if your pet regularly sleeps outside and flea numbers are high, these areas can be treated with a spray containing pyriproxyfen. If possible, open sleeping areas to sunlight by removing low-hanging vegetation. Immature fleas are unlikely to survive in areas with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



Inside the home:

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 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.**
- ◆ **During the next 2 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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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 also can 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 finely shredded paper or other fibrous material.**
- ◆ **Check for musky odors associated with mice.**
- ◆ **Mice are most active at night, but you can see them 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 doors, windows, and screens fit tightly.**
- ◆ **Feed pets only the amount of food they will eat at a single feeding.**
- ◆ **Seal all food storage and garbage containers.**
- ◆ **Thin or remove plants next to or climbing up buildings, since house mice are excellent climbers.**

Remove mice from your home by trapping.

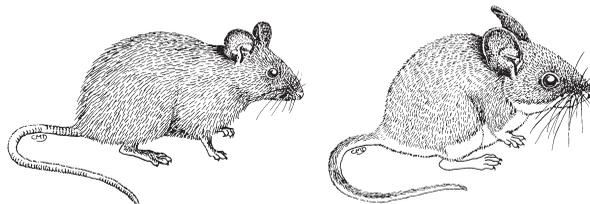
- ◆ **Snap traps and glue boards are the safest and most economical.**
- ◆ **Place traps in secluded areas along walls, behind objects, in dark corners, and in places where you find droppings.**
- ◆ **Bury dead rodents or place them in plastic bags and put them in the garbage. Do not touch mice with your bare hands, and wash hands thoroughly after handling traps.**



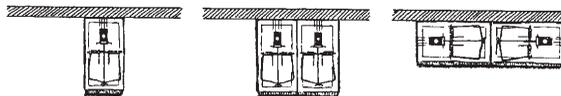
What about poison baits?

- ◆ **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 for complete instructions on carrying out these practices.



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



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

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Rats

Rats are some of the most troublesome and damaging rodents. They eat and contaminate food, garden produce, and fruit and transmit diseases to humans and pets. Manage rats 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?

- ◆ The stocky Norway rat builds 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 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/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 $\frac{1}{4}$ inch.
- ◆ Make sure doors, windows, and screens fit tightly.



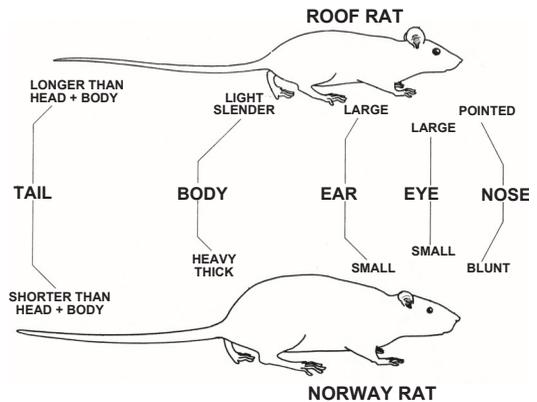
Remove rats from the home by trapping.

- ◆ 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 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 outside to prevent poisoned rats from coming inside 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 for more details on rat management.



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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. Trapping or nest treatment may reduce populations. Pesticides other than nest treatments usually are 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 (although 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 rarely are 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.**



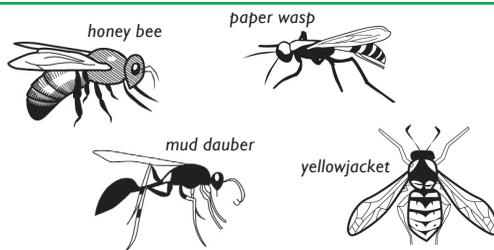
Use traps to reduce yellowjackets locally.

- ◆ **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 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 shouldn't require treatment unless they are near human passageways.**

Check out our Web site at www.ipm.ucdavis.edu for more details on yellowjackets and wasp and bee stings.



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