

# Cockroaches

Cockroaches are highly adaptable insects that have survived for millions of years. In Alaska, cockroaches can be pests inside buildings and structures. They do not bite people but can cause problems in several ways. They can contaminate food products, they may spread diseases, and they can cause allergic reactions in some people. Children are especially susceptible to cockroach allergens, which may cause asthma or other health issues. Successful cockroach management depends on proper identification, determining the population, modifying the environment and taking appropriate control steps.

## Cockroach Biology and Identification

The cockroach is an insect with three life stages: **egg**, **nymph** and **adult**. **Eggs** are deposited in an egg case, called an ootheca, which may contain 14 or more eggs. Depending on the species, the egg case is either carried by the female until the eggs hatch or is glued to a sheltered place, such as debris, furniture or the building structure. Most cockroaches are transported during the egg stage in shipping containers and items of commerce and travel. The timing of egg hatch varies among species. **Nymphs** are immature cockroaches that emerge from the eggs. They closely resemble adults but are smaller in size. They shed, or molt, their hard outer covering (called an exoskeleton) several times before reaching adulthood. The cockroach life cycle can range from 64 to 1,071 days, depending on species.

Cockroaches typically hide during the day and are active during the night searching for food and water. All cockroaches have a similar oval shape and low stature, which enables them to squeeze in and out of tight places.

Although all cockroach species share similarities, it is important to identify the individual species so that control efforts can be targeted to that species. The more common cockroaches in northern areas include the smaller-sized German cockroach (*Blattella germanica*) and the brown banded cockroach (*Supella longipalpa*), and the larger American cockroach (*Periplaneta americana*) and oriental cockroach (*Blatta orientalis*). German cockroaches are Alaska's most abundant cockroach; they are



*Blattella germanica*, German cockroach adult.  
Credit: Clemson University, USDA Cooperative Extension Slide Series, Bugwood.org



*Supella longipalpa*, brown banded cockroach adult.  
Credit: Clemson University, USDA Cooperative Extension Slide Series, Bugwood.org



*Periplaneta americana*, American cockroach adult.  
Credit: Clemson University, USDA Cooperative Extension Slide Series, Bugwood.org



*Blatta orientalis*, oriental cockroach adult female with egg case. Credit: Daniel R. Suiter, University of Georgia, USDA Cooperative Extension Slide Series, Bugwood.org

often imported with shipments of commercial items and personal belongings. Adults are  $\frac{1}{2}$  to  $\frac{5}{8}$  inch long and pale brown in color, with two parallel dark-brown streaks behind their heads. German cockroaches are usually found in warm, moist areas like restrooms, greenhouses and food preparation areas. Brown banded cockroaches are approximately  $\frac{1}{2}$  inch long, tan-golden in color, with faint, lighter-color bands on their wings. They may be found throughout a structure, but they prefer drier, higher locations such as ceilings and upper floors of buildings. They are attracted to equipment that gives off heat, such as computers and other electronics. American cockroaches are  $1\frac{1}{2}$  to  $1\frac{3}{4}$  inches long and reddish brown in color. They prefer warm, moist areas, including basements, sewers, heating ducts and steam tunnels. Oriental cockroaches are  $1\frac{1}{4}$  inches long and dark brown in color. They prefer cool, dark, wet areas such as damp basements, floor drains, grease traps and sewers where decaying organic matter is present.

## Pest Management

Cockroaches are best controlled by a coordinated, planned approach called integrated pest management (IPM), which involves the following steps:

- Proper identification of the pest
- Monitoring the pest population
- Establishing a cockroach population tolerance level above which active pest control is implemented

- Implementing control efforts as needed based on monitoring results and pre-established tolerances
- Evaluating the results
- Continued monitoring and control as needed

Effective cockroach control strategies include prevention, sanitation, trapping, environmental modification and chemical control.

### Prevention

Prevention is a critical step in cockroach control and includes measures that keep cockroaches and egg cases from entering a structure. It also involves inspecting all incoming items of commerce, food and beverage containers, equipment, furniture and luggage, especially if these items are coming from locations known to be infested.

### Sanitation

Sanitation is an essential component of any cockroach control program. Debris provides cockroaches with their life essentials: food, water and shelter. Waste management is necessary to prevent cockroaches from entering a structure and to reduce populations. Exposed food, food waste and unwashed cooking utensils should never be left out overnight. Food storage areas should be kept clean and all human and animal food should be stored in sealed containers with tight-fitting lids.

### Trapping

Trapping is an effective tool used for monitoring cockroaches. Proper trapping focuses on points of

entry, including shipping docks, doors, unsealed utility entry points, and structural cracks and crevices. It involves placement of adhesive-coated insect monitoring traps on the floor parallel to the wall in kitchens and closets, under refrigerators and heaters, in dark storage areas and moist locations, and in false ceilings of the buildings or structures being monitored. In large buildings, traps should be numbered and a map drawn indicating the placement of each trap. Traps should be checked at least weekly, more often initially, and discarded and replaced as they become soiled. Since cockroaches are nocturnal, the most reliable monitoring is done at night. The life stage and number of each cockroach species trapped should be recorded, since specific control efforts are not the same for all cockroach species. Control efforts should focus around those traps with the greatest cockroach population.

### **Environmental modification**

Environmental modification requires the elimination of the cockroach's access to food, water and/or shelter. Cockroach activity can be discouraged by eliminating hiding and breeding places — including structural cracks, crevices and holes around plumbing fixtures and along baseboards and ceiling edges — and monitoring structural temperature, moisture and lighting.

- Fix plumbing leaks.
- Keep outside drain gutters clean and draining away from structure.
- Reduce humidity where cockroaches congregate.
- Clean, screen and monitor grease traps, floor drains and sump pumps.
- Keep air ducts and windows in good repair with tight-fitting screens.
- Use sodium vapor or yellow lights for exterior lighting.
- Seal and caulk structural cracks and crevices where traps indicate a high cockroach population. Before sealing, vacuum or air blast the crack or crevice to remove eggs, hidden cockroaches and substances that reduce the adherence of the caulking to the edges of the crevice.

### **Chemical Control**

Chemical control of cockroaches should be the final step, not the first. Pesticides are wasted if the building or facility is not kept clean, sealed and unsuitable for cockroaches. Chemicals used to kill, control or mitigate a pest are called pesticides and are registered by the U.S. Environmental Protection Agency. Insecticides are a group of pesticides used against insect pests, including cockroaches. Only pesticides that are registered by the EPA and by the State of Alaska Department of Environmental Conservation Pesticide Control Program may be used in Alaska. Information on pesticides registered for use in Alaska is available at <http://dec.alaska.gov/eh/pest/index.htm>. Direct spraying of pesticides in structures to control cockroaches is often unnecessary. Likewise, pesticides packaged as foggers or “bug bombs” are seldom effective and increase the likelihood of poisoning people, pets and nontarget organisms.

**Read and follow label directions before using any pesticide and observe all safety precautions. Never use a pesticide inside a structure unless the label states the product is registered for use indoors.**

Pesticide dusts, like boric acid and diatomaceous earth, are used to control cockroaches. Boric acid is an active ingredient that provides slow-acting, effective and long-term cockroach control. To insects, boric acid is a stomach poison that also affects the nervous system. Boric acid can be a skin and eye irritant to humans and should never be in reach of children or pets. When used, boric acid should be applied as a very thin surface film, never mounded. Because of the difficulty of placing of boric acid, it is seldom the first choice in the chemical control of cockroaches. Diatomaceous earth is a naturally occurring quartz-like substance that scratches the exoskeleton of insects as they walk through it, causing them to desiccate and die. Diatomaceous earth is applied as a surface dust on floors and behind walls. It is ineffective once wet and, as noted above, most cockroaches favor areas of high moisture.

Insecticide baits are increasingly used by pest control professionals for cockroach control. To reduce the area where pesticides are applied and the amount of pesticide used, baits specific to

cockroaches are placed where cockroach populations are known. It is important that baits be carefully placed so that cockroaches readily visit and feed on the bait. Bait stations should never be placed where children or pets have access to them. Bait stations, like traps, need to be monitored and replaced as needed.

The most common bait formulation is a ready-to-use gel. Other bait formulations are available in liquid, granular and solid form. The choice of formulation depends on the placement of the bait. Insect growth regulators (IGR) are pesticides but are not used as baits; however, they impede insects from maturing and multiplying and are also effective tools for a cockroach control program. Some active ingredients registered in Alaska for cockroach control include abamectin, dinotefuran, fipronil, hydramethylnon, hydroprene, imidacloprid, indoxacarb and silicon dioxide.

### **Professional Pest Control Operators**

There may be situations where the services of a professional pest control operator are required. Make sure the operator is registered and insured as a commercial pest control applicator in Alaska for Category 7, Industrial, Institutional, Structural and Health-Related Pest Control. Individuals applying pesticides to property other than their own or that

of their employer must be a certified pesticide applicator with Alaska DEC.

Before signing a pest control contract, determine what control measures will be used, if reapplications will be necessary, what guarantee is provided and the total costs involved. Multifamily housing units require a coordinated approach for cockroach control, and property managers should consider consulting a professional pest control applicator for assistance.

### **Additional Information**

UAF Cooperative Extension Service IPM program can assist in pest identification and control. Contact the IPM program at [www.uaf.edu/ces/ipm](http://www.uaf.edu/ces/ipm).

The National Pesticide Information Center (NPIC) has a web page on cockroaches at <http://npic.orst.edu/pest/roach.html>.

Utah State University Extension Fact Sheet ENT-136-10 Cockroaches has graphics on cockroach identification available at <http://extension.usu.edu/html/publications/publication=12600&custom=1>.

Penn State Extension has a number of publications with useful graphics and cockroach information available at <http://extension.psu.edu/pests/ipm/pest-problemsolver/public-health/cockroaches>.

*To simplify information, trade names of products have been used. No endorsement of named products by the University of Alaska Fairbanks Cooperative Extension Service is intended, nor is criticism implied of similar products that are not mentioned.*

**[www.uaf.edu/ces](http://www.uaf.edu/ces) or 1-877-520-5211**

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