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Cockroaches and their control

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Cockroaches are primitive and highly successful animals; their general body form has changed little in the past 300 million years. They have adapted well to human habitations and live in most human communities around the world.

Their wide distribution is due to their ability to be transported via human-aided transport. They are highly adaptable and are typically found in decaying leaf litter, under bark, in caves and burrows, on the foliage of shrubs, in the nests of social insects, in rotting wood and in semi aquatic environments.

They are known as a pest insect because they cohabit with humans in dwellings, especially in kitchens, where some species can carry disease organisms like *Salmonella*, which may cause gastroenteritis, dysentery, tuberculosis, hepatitis, typhoid fever and many other human disorders.

Cockroaches can also carry viruses and eggs of worm parasites. The health threat posed by cockroach populations closely cohabiting with humans justifies their control in premises.

Most native Australian cockroaches are found among the vegetation, leaf litter and soil of undisturbed habitats. There is only a small number of pest cockroaches of which most are introduced. This Gardennote describes the main pest cockroaches and suggests preventative and practical control methods. It does not recommend specific chemicals as chemical registrations change constantly. For registered chemicals, consult your local hardware shop, chemical retailer or pest control agent.

Biology

After mating, eggs develop in the female in a purse-shaped egg case called the ootheca, which can contain between 12 and 40 eggs, depending on the species. The ootheca may be glued to a surface and left unattended or dropped just prior to hatching. Immature cockroaches, referred to as nymphs, emerge from the egg cases. Nymphs look like small versions of the adults but do not have wings. The nymphs grow into adults through a number of moults which takes between two months and a year, and then live as adults from a few months to over a year, depending on the species. During her adult life, a female may produce between 5 and 30 oothecae.

Cockroaches are omnivorous, which means they eat virtually any organic matter.

The pest species of cockroach are gregarious, forming groups of adults and immature nymphs. They are mostly nocturnal creatures, hiding during the day. Cockroach activity during the day indicates a cockroach overpopulation. Most pest species need ready access to water.

Types of pest cockroaches

German cockroach

The body of an adult German cockroach is about 12 mm long. It is beige to light brown in colour, with two dark stripes on the back of its head. It is the most widespread and successful cockroach and is commonly found in homes, apartments, restaurants, food processing plants, supermarkets and warehouses.

The German cockroach seeks warm moist conditions with access to food and water. Domestic or commercial food-handling areas provide these conditions, where they are active at night. They like to hide during the day in dark, secure places. Their daytime harbourage areas are moist areas near sinks, dishwashers, cracks and crevices in the pantry, kitchen and bathroom cupboards, under electrical, heating and cooking appliances and inside wall cavities or behind skirting boards. They can often be seen on the undersides of drawers or benchtops.

Although adults are winged, this cockroach rarely flies. Dispersal is mainly through individuals or egg cases attached to food containers, cartons, fridges, stoves and other appliances or materials brought into a building.

Figure 1: German cockroach

German cockroaches do not thrive in locations away from humans or human activity. The German cockroach is the most prolific breeder of cockroach species. The female lives up to six months. She carries an egg capsule containing 30 to 40 eggs. Development from egg to adult can occur in 45 days, during which the nymphs moult six times.

Because of the rapid breeding, a small initial infestation can become a major problem within a few months.

American cockroach

The American cockroach is the largest of the cockroach pest species. Its adult body is 30 to 50 mm in length and is reddish brown with a yellowish band behind the head. It lives in warm, moist, dark conditions – indoors in colder regions, but mainly outdoors in warmer regions. Its preferred daytime habitats are the warm, dark, moist locations associated with sewers, and wall, roof and subfloor voids. They often congregate around hot water pipes, fridge motors, boilers and other heating appliances.

The American cockroach prefers decaying, organic matter, but will feed on a wide variety of plant and animal material. They fly readily and are attracted to lights, especially on warm summer nights. They can often be seen around stormwater drains during summer.

The female life span is up to two years. Even though the incubation period of eggs is five to eight weeks, under ideal conditions they quickly reach plague proportions. An adult without food or a water source may survive for about two to three months.

Figure 2: American cockroach

Native Australian black cockroach

The native Australian black cockroach is commonly found indoors during the summer months. It is black with a white margin and grows to 35 mm in length and is wingless, even in the adult stage. This cockroach is primarily an outside species which feeds on decaying plant material. It is not a recognised carrier of disease because of its preference for leaf litter over human refuse. In summer it comes inside probably due to the cooler and damper conditions.

Figure 3: Native Australian black cockroach

Brownbanded cockroach

The relatively small brownbanded cockroach is pale brown with very pale bands across the thorax and abdomen. Unlike the other pest species it can live in dry situations and may be active throughout the building, rather than being restricted to the kitchen and other damp areas. They are particularly suited to our modern technology and are often found in electrical equipment such as computers, keyboards, microwave ovens, wardrobes, dressers, cabinets and behind bookshelves. Their wide dispersal within premises can make control difficult.

Its egg cases are glued to surfaces and the hatched nymphs require two to four months to develop into adults. Adults can live for up to six months.

The brownbanded cockroach may fly if disturbed. It is not unusual for it to be observed during daytime.

Figure 4: Brownbanded cockroach

Cockroach prevention

Hygiene is the single most important factor in managing cockroach problems. Making access to food and water difficult constrains their normally high population growth.

Older buildings can be troublesome because old plumbing piping and equipment can leak and create damp conditions ideal for cockroaches. Fixing leaking equipment is a very important step in reducing the suitability of buildings to cockroaches.

Sealing possible access points which would otherwise allow cockroaches to enter buildings from outside, is also very important. Doors and windows should be kept closed or screened at night time to prevent cockroaches being attracted to lights and simply flying in. Other common sense methods to reduce cockroach problems include:

- Avoid leaving food-contaminated surfaces (benches, plates, dishes) overnight
- Reduce water availability overnight, mop up puddles, fix dripping taps and seal around sinks
- Store food in tightly closed, cockroach-proof containers
- Inspect incoming food for egg cases
- Store garbage in tightly closed containers

- Fill cracks and crevices that can act as shelter
- Inspect and clean surfaces below food processors and toasters
- Clean ovens, cupboards and shelves
- Avoid dropping crumbs and spilling sweet drinks in the vicinity of computers and keyboards

Chemical control

If chemical control is used, apply the chemical in a manner to ensure that the target insects have contact with it.

Surface-sprays are residual and should be applied to cracks, crevices and voids that may serve as a home for cockroaches. Pay particular attention to rubbish bins and receptacles. The bases of bins can be treated to ensure cockroaches contact the insecticide on their way to gaining access to the bin contents.

When treating cupboards, treat all the internal angles so that cockroaches must contact the treated surface when moving from a shelf to a wall/top and vice versa.

For German cockroaches, apply the spray to the undersides of drawers and shelves. Do not treat surfaces where food is handled and which regularly get washed down. If storage areas are treated, remove food before treatment and replace after the treatment has dried. These surfaces may stay insect-active for months. Surface-sprayed insecticides usually act on contact, whereby the insecticide is absorbed by the insect through the cuticle.

External to the building, spray around rubbish bins, sewer and drain inspection grids and all points of access such as around doorways and windows.

Dusts are used where wet sprays can be a problem (for example, near electric wiring) and where there is no likelihood of humans disturbing the dust deposit (in roof spaces or wall voids). Apply dust lightly. Depending on the dust used, it can give months of protection.

Baits and traps can control small infestations but are usually more effective if used in conjunction with other types of management methods. However, ensure that sprays do not contaminate baits as this will make the baits repellent to the cockroaches and therefore ineffective. Baits should be placed in corners and along edges (not treated with insecticide) where cockroaches travel. Traps are useful to monitor cockroach infestations as they can indicate their presence and level of activity.

Control by natural enemies

Natural predators of cockroaches are various arthropods (including spiders), frogs, lizards, birds and mammals. Some wasps parasitise cockroach egg cases.

Acknowledgements

All photos except the Native Australian black cockroach (Figure 3), by Clemson University – USDA Cooperative Extension Slide Series. www.ipmimages.org

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