

# Cockroaches

and their control



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“They’re everywhere! They’re everywhere!  
What have you been doin’? Feedin’ them?”

“They’re so big you could throw a saddle on them!”

“They’re as big as skateboards!”

Yes, you’ve heard it all before and, no doubt you’ll keep on hearing those time worn phrases as long as you’re in the business of cockroach control. What is it about cockroaches which excite the fervour of so many people? Is it their loathsome appearance? Their rapid unpredictable movement? Their reputation as disease carriers? Their habit of popping up in unexpected locations including the salad roll you just bought for lunch? Or is it a combination of all the foregoing? No matter how you look at cockroaches, nobody wants to see them around. Well, maybe pest managers don’t object to their presence when they’re looking for some business but, pest managers certainly don’t want them to be there after the contract has been signed!

Cockroaches have long had the reputation of being difficult to get rid of and perhaps that was true fifty years ago. However,

nowadays, when we have access to so many economical and efficacious insecticides, there is absolutely no excuse for not being able to effectively control an infestation of cockroaches in both domestic and commercial properties. Sure, you may always see cockroaches after you start treating a location but, they should be the exception and not the norm. It would be true to state categorically that the only reasons for failure are laziness or haphazard procedures on the part of the pest manager, too infrequent service periods or massive re-infestation pressure from incoming goods or adjoining premises.

In this bulletin, we will look at the WHAT, WHY, WHERE and HOW of effective cockroach control. Remember, we are exponents of Integrated Pest Management and we need to apply all facets of such a discipline.



# WHAT?

Cockroaches belong to the insect order Blattodea of which there are approximately 4,000 species worldwide and 400 species native to Australia. Native species vary in appearance, habitat and feeding habits. Unfortunately (or fortunately if you consider our role as pest managers) for us, there are a number of introduced pest species here also. All species are thought to have originated in the tropical and sub-tropical areas of Africa around 300 million years ago. They range in size from just a couple of millimetres in length right up to an enormous 70 millimetres in the case of the Giant Burrowing Cockroach (*Macropanesthia rhinoceros*) from northern Queensland.

No matter the size, they are all based on a similar body plan:

- Oval shaped body which is dorso-ventrally compressed,
- Two pairs of membranous wings when present, with the forewings more sclerotised than the hind wings,
- The thorax protected by a large plate, the pronotum, which extends over the head,
- Strong chewing mouthparts,
- Compound eyes,
- Long whip-like antennae and,
- Prominent leaf shaped cerci at the tip of the abdomen.

## COCKROACH SPECIES

Cockroaches are insects of the order Blattodea, of which about 30 species, of which about 30 species out of 4500 total are associated with human habitations. Several species are well known as pests.



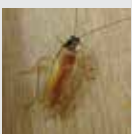
### **German Cockroaches** (*Blattella germanica*)

Adult German cockroaches average about 1.5 cm in length. They have long antennae which they use to detect chemicals, moisture, air currents, and probably sound waves in their environment. They prefer warm, moist area, and are frequently found in kitchens and bathrooms. They are brown coloured with two dark parallel streaks running from the head to the base of the wings. Female cockroaches carry their ootheca with her during the germination rather than depositing it like other species.



### **American Cockroaches** (*Periplaneta americana*)

They are large roaches, ranging in length up to 4 cm. They prefer dark, moist, warm areas. They are commonly found in basements, steam tunnels, boiler rooms, rubble foundations, and similar places. Often they aren't even noticed until a light is turned on, and they scurry away rapidly. Adult of both sexes have working wings and at least some flight capability, but oddly enough, they seldom fly.



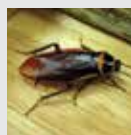
### **Brown-Banded Cockroaches** (*Supella longipalpa*)

They are 1.5 cm length as adults. Adults of both sexes have wings, although only the males fly. Brown-banded cockroaches have two light-coloured bands running across the base of their wings, hence the name "brown-banded cockroach". Compared to other common roaches (such as the German cockroach) brown-banded cockroaches tend to prefer drier conditions. They're commonly found in bedrooms



### **Brown Cockroaches** (*Periplaneta brunnea*)

Brown cockroaches are large species of cockroaches. They are about 3-4 cm long and have wings. They are dark, reddish brown in colour. The brown cockroaches can be distinguished from American cockroaches by observing their cerci, which are two pointed barbs, or spines, near the posterior end of some cockroaches. Brown cockroaches have a pair of blunt, short and dark cerci while the American cockroaches have longer and sharp pointed cerci.



### **Australian Cockroaches** (*Periplaneta australasiae*)

Australian cockroaches are also large species of cockroaches. They are winged and can be about 3-4 cm in length. They are dark brown in colour. Australian cockroaches are very similar to American cockroaches but can be distinguished by a yellow margin on the thorax and yellow streaks as its sides near the wing base. They normally feed on plants unlike other cockroaches and can also feed on different organic substances including decaying substances.



### **Smooth Cockroaches** (*Symploce pallens*)

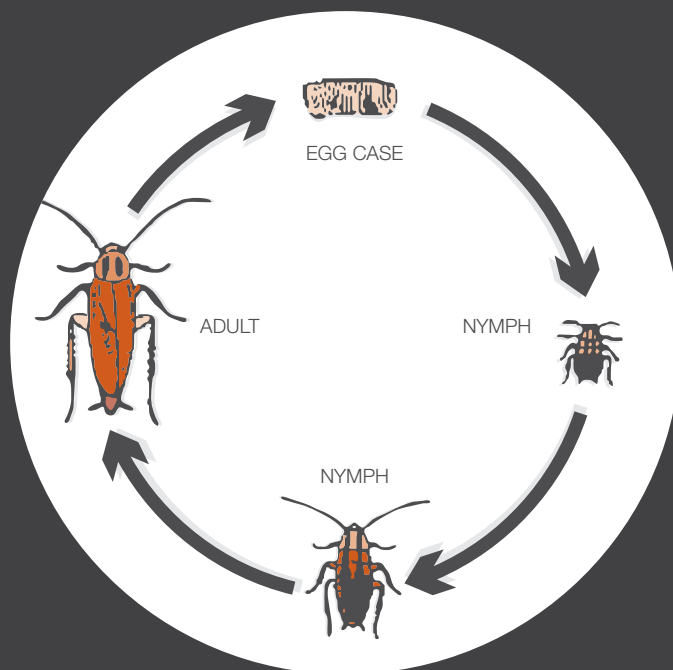
They are brownish yellow in colour, smaller in size (12-15 mm) compared to German or American cockroaches. Adult males have longer wings which may extend till the abdominal tip. Adult females have shorter wings which may cover only one-third of its abdomen.



## LIFE CYCLE

Cockroaches undergo an incomplete (or gradual) metamorphosis with the juvenile stages being similar in appearance to the adult form, apart from the presence of wings. Female cockroaches produce an egg case (ootheca) after mating and they either deposit this sometime before or immediately prior to the baby (nymph) cockroaches emerging. According to the species involved, there are a number of juvenile stages lasting from six to twelve months. Adults can live from three to twelve months. (Refer to "Urban Pest Management in Australia" 5th Edition 2008, by John Gerozisis, Phillip Hadlington and Ion Staunton for more details on life cycles.) Juveniles and adults are found living together in aggregations with up to 75% of the aggregation consisting of juveniles. All stages have similar mouthparts and feed upon identical foods. This makes it easier for us when we launch a control programme as all our targets are just sitting there waiting for us to blitz them.

One thing that cockroaches can do well is breed. Five female German cockroaches which become sexually mature on January 1st can produce a staggering 300 million offspring after twelve months! There would be 225 million juveniles and 75 million adults. You might already know this because of previous exploits into commercial kitchens or neglected households. In fact, you might think that this is an underestimate after looking into some cupboards and motors! When you open the back door of a restaurant and fifty German cockroaches fall onto your head, that's when you start to worry!



## WHY?

So, why are cockroaches considered to be pests? Why should homeowners and commercial businesses want or need to rid their premises of these insects? Well, for a start, their presence in commercial premises contravenes health regulations and could result in a hefty fine and, possibly worse still, being placed on the "Name and Shame List" of their State Health Dept. However, if that's not sufficient reason, cockroaches are probable carriers of a number of debilitating diseases including salmonellosis, dysentery, typhoid, hepatitis and tuberculosis. There is no unequivocal proof that cockroaches are disease carriers unlike in the case of rodents and flies but, it doesn't take much imagination to conjure up the image of them crawling through drains and sewers and then scuttling across the speciality of the house!

What is possibly more disturbing to families is the fact that people can become allergic to cockroaches and their faeces. "This allergic reaction is a worldwide phenomenon, with sensitivity to cockroaches ranging from 23–60% of the population tested. There seems to be a particular association between cockroach allergens and asthma but they can also cause rhinitis and dermatitis. The allergens are potent sensitisers of children and exposure to cockroach allergens early in life has been found to be a predictor for the development of asthma."

There is, over and above everything else, a certain aura of disgust which surrounds cockroaches – arising from their invasive qualities, their distinctive odour and their perceived association with poor standards of hygiene. When you see a cockroach, you just want to stomp on it!

## WHERE?

Where do you find cockroaches? A better question might be, "Where don't you find cockroaches?" They can be found on all continents allegedly including Antarctica where they would be found shivering inside a scientist's hut if they were to be found anywhere. Of course they are happiest in warm, humid conditions such as are found in the tropical regions of the world or inside a typical commercial kitchen. They can't tell the difference. With regard to Australia's pest species, German cockroaches (*Blattella germanica*) can be found throughout

Australia but less commonly in the southern parts especially Tasmania. They prefer warm, moist areas which remind them of their tropical origins. In a kitchen, they can be found in places which provide warmth, food & moisture so a dish washer is prime real estate as far as they are concerned. When such desirable habitats are fully occupied, they start to move out to less suitable environments. A really heavily infested house had German cockroaches not only throughout the kitchen and laundry but also up the chimney, inside the television set, inside

lounge chairs, behind wallpaper and even underneath the linoleum! When the initial treatment was over, three large buckets of dead cockroaches were picked up! The larger *Periplaneta* species (American, Australian and Smoky Brown) are more common in the warmer areas with Australian cockroaches beginning to proliferate from the North coast of NSW upwards. They don't require the same amount of moisture as their smaller cousins and can be found in places such as roof voids, cavity walls, sub-floors, drains, grease traps and sewers.

Oriental cockroaches (*Blatta orientalis*) are rarely found in the warmer parts of Australia but can, allegedly, be found in the

cooler parts of Australia. Even there, they are not common. However, if you ever visit the UK, they are the most common species.

Brown banded cockroaches (*Supella longipalpa*) prefer warmer temperatures than the Oriental (above 27 degrees Celsius) and are also less needful of moisture so can be found in locations far distant from a source of water e.g. behind pictures. They too are quite rare in Australia. Refer to your copy of "Urban Pest Management in Australia" for more details of cockroach ecology.



## HOW?

Which of the following statements are true?

- Cockroaches! They're almost impossible to get rid of! They wouldn't even be killed by an atomic blast!
- Cockroaches! We used to be able to eradicate them but then the government banned all the good strong chemicals. With the weak stuff you buy today, we've got no chance!
- Cockroaches! Pest controllers could get rid of them if they wanted to but then they'd be out of a job so they always leave a few behind to breed up.

Hopefully you said, "None of the above!" In fact, cockroaches are not particularly difficult to control if you have a few certain factors going for you. You need a real desire to succeed, patience, perseverance and the right tools for the job. Globe Australia can provide the tools but you need to supply the correct mental attitude. If you start a job thinking that the insecticides will do all the work for you, then you and your client will be disappointed. You need to work in a diligent, systematic fashion and you need to be trained by somebody who has experience in the field and the ability to train correctly.

Now, let's look at what tools you require to start out:

- First and perhaps most importantly, you need a strong, reliable torch,
- A note book for recording data,
- PPE as listed on the product label,
- Disposable gloves to prevent soiling your hands when not wearing your elbow length gauntlets (many pest managers use these exclusively),
- Overalls to protect your clothes when crawling across dirty floors,
- A compressed air sprayer with a range of nozzle types and extension rods,
- A hand powder duster,
- An electric powder blower for roof voids and sub-floors,
- A gel gun,
- Access gaining tools such as screwdrivers and spanners,
- A small mirror to see around corners,

- Clean rags to mop up over spray,
- Cockroach glue traps for monitoring purposes, and perhaps,

There are many effective insecticides available on the market. You can be assured that all registered products kill insects but some may be more effective or economical than others. You will need to make your own decision as to what products you come to rely on. Be guided by chemical suppliers, sales representatives and other pest managers. Remember, if there is a failure to achieve results, the fault most probably resides with the operator and not the insecticide.

The standard list of insecticides would include:

- Two residual insecticides (with different modes of action),
- An insecticidal dust,
- An Insect Growth Regulator,
- An aerosol with applicator nozzle,
- Two cockroach gels (with different modes of action), and for big jobs.

For more detailed information on equipment and products, refer to the Globe publications, "Inspect, Detect, Protect – Gels & Baits Product Guide," and "The Cockroach Solution Guide."

Cockroaches are not particularly difficult to control if you have a few certain factors going for you. You need a real desire to succeed, patience, perseverance and the right tools for the job.



# CONTROL MEASURES

## SITE EVALUATION

Need it be said? First and foremost, YOU NEED TO CARRY OUT A THOROUGH INSPECTION. (Of course, you also need to carry out a Risk Assessment.) You are looking for evidence of activity such as live or dead insects, cast nymphal skins, egg cases, droppings, regurgitation marks and you can even smell them out if there is quite a few of them. Carry out the inspection in a systematic manner from left to right or vice versa depending upon your preference. DO NOT USE AN AEROSOL AS A FLUSHING AGENT as this merely disperses them and makes subsequent control efforts much more difficult. Look for locations which provide warmth, moisture, food and shelter such as dishwashers, refrigerator motors, microwaves and coffee machines. Do not neglect any possible harbourage as adult German cockroaches can hide in a gap less than 2 millimetres high. Look for hygiene and proofing issues which may contribute to the pest problem. Write them down and detail any recommended actions.

## TREATMENT

Now that you are aware of all actual and potential harbourage areas, you can apply your insecticide. There can be nobody in the vicinity while you are working and you may need to put out warning signs. Refer to the NSW WorkCover publication, "Safe Use of Pesticides Including Herbicides in Non-Agricultural Workplaces Code of Practice 2006" for detailed information on relevant safety precautions. For a heavy infestation, you will achieve better and quicker results if you apply a liquid insecticide with added insect growth regulator and treat any voids or cavities with insecticidal dust. Some pest managers rely almost exclusively on cockroach gel as their one and only method of treatment and these products are effective control agents. However, they are not rapid acting and it may be some days before results are noticed. For initial treatments, a liquid residual insecticide plus dust will give faster, more impressive results. You will need a crack and crevice/borer nozzle and apply the spray with a low pressure into harbourages. It is not wise to spray skirting boards/carpet edges as has been the custom of some pest managers in the past. This procedure is not productive and may lead to staining of surfaces. Always prepare and apply insecticides according to label requirements.

You can apply dusts to voids and cavities where it will not be blown onto foodstuffs, food handling surfaces or cooking utensils. It must be applied lightly or the cockroaches will avoid it. Do not apply it in areas which will become wet. Dust can be applied to enclosed roof voids or sub-floors where it will not contaminate any stored materials.



Cockroach gels are relatively new on the scene having appeared only in the last 20 years. They are cost effective and provide excellent results when used according to label instructions relating to "dot" size and spacing. They should be applied with a proper gel gun not just squeezed from the tube. Many pest managers use gels to the exclusion of all other formulations and there is nothing wrong with that approach but, as mentioned prior, they will provide slower results. Other pest managers only use gels to treat harbourages where liquids or dusts may cause problems e.g. electronic equipment. This is a more economical approach.

## AFTER TREATMENT

After the treatment, you should sit back and evaluate the situation. Are there cockroaches emerging from a harbourage? You may need to apply additional insecticide or knock them down with an aerosol. Is there a spot you may have missed? Walk around and re-inspect. You will need to stoop to look under fittings and you may need your ladder to look up high. Are there any liquid or dust puddles? You will need to remove those before the client re-enters. Place cockroach glue traps in the worst harbourage areas. These will give you valuable information when you return. If there are lots of cockroaches stuck on them, you will need to do another thorough treatment.

After completing the necessary paperwork, take another look around. Is there anything you may have missed? Detail any client recommendations regarding hygiene and proofing. Tell them how important it is for an integrated pest management programme that all these recommendations are acted on. Don't be surprised if your recommendations are not promptly actioned.



## SERVICING INTERVALS

Now that you have completed the initial treatment, you will need to return to ensure that the results are satisfactory. In your quotation, you will have noted any follow-ups and service intervals. Always make at least one follow-up visit after ten to fourteen days. Check your glue boards to see if there is any fresh activity. If there is, you will need to re-treat and come back again a week later to check the results. You should never leave a site if you think that live cockroaches are still there unless you have applied gel to those areas.

For most food facilities e.g. restaurants, hotels and food manufacturers, at least a monthly service is required. Some sites have weekly or even twice weekly visits. With other non-food sites, a quarterly service may be all that is required. With domestic premises, your service schedule is more flexible. Some companies provide three or six monthly free service periods. With experience, you will be able to decide on service intervals with more precision.

## SUMMARY

- Cockroach control is relatively simple,
- Seek guidance from more experienced pest managers,
- A thorough inspection using a strong torch is essential,
- Use only quality equipment & insecticides,
- Apply all insecticides according to label instructions,
- Use the appropriate PPE,
- Treat all harbourage areas with a suitable formulation,
- Clean up after your treatment,
- Monitor results with glue boards,
- Provide recommendations for hygiene and proofing,
- Follow up on your initial treatment as required and, most importantly,
- Be patient and persevere until you achieve results.





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