



Cockroaches

Scientific name: Blattodea



Profile

Part 1



Profile of a Cockroach

- ▶ An ancient group - unchanged for millions of years
- ▶ Most closely related to termites (Isoptera)
- ▶ Around 4,000 species of cockroaches
- ▶ Four main pest species.
- ▶ Ability to eat almost anything. This is a great advantage when competing with other species for food.
 - ▶ OMNIVEROUS
- ▶ Cockroaches can produce over 20,000 young / year.

Profile of a Cockroach

- ▶ They harbor and transmit diseases since they eat just about anything, including food in our kitchen trash can.
- ▶ After feeding on contaminated food, disease bacteria can remain in the cockroach digestive system for a month or more.
- ▶ Food & utensils can become contaminated with cockroach faeces.
- ▶ *Salmonella* bacteria can survive in cockroach faeces for several years.
- ▶ Many people who are allergic to house dust are also allergic to cockroaches. Crushed cockroach body fragments and faeces can be a major constituent of house dust.

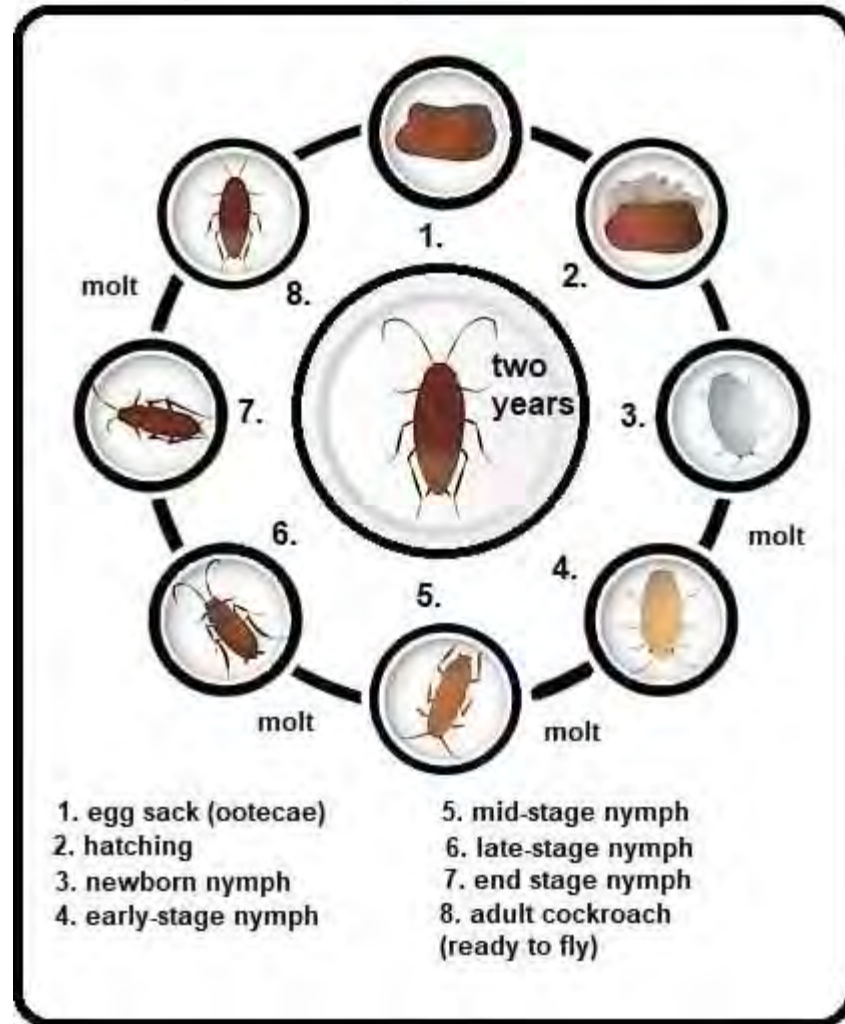


Understanding the Species

- ▶ The cockroach is exceedingly hardy. It thrives on only crumbs and can survive long periods of time without food or water.
- ▶ Cockroaches often live in cracks and crevices so small that we can easily overlook them.
- ▶ It is a common misconception that cockroaches live in homes that are dirty and not well kept.
- ▶ Cockroaches live in dwellings belonging to all ethnic groups and all economic classes of people.
- ▶ A clean home will not sustain as many cockroaches as an identical home that is cluttered and dirty because there is less food and harborage for the cockroaches.
- ▶ Factors, like humidity, and harborage (i.e. cracks and crevices) are very important in influencing infestation levels.

Understanding the Species

- ▶ Insect control is to know what pest you are dealing with.
- ▶ Each of the domestic cockroach species prefers different areas in a residence so identification is important for best control.
- ▶ A typical infestation is composed of individuals of different sizes, including reproducing adults and immature individuals.
- ▶ Immature cockroaches, *NYMPHS*, are smaller than *adults*. As the nymph grows, it sheds its "skin" or *EXOSKELETON* to grow.



Know Your Enemy



Life Cycle of Cockroaches



German Cockroach



Brownbanded Cockroach



Oriental Cockroach



American Cockroach

German Cockroach

German cockroach

(*Blattella germanica* Fabricius)

[Blattidae: Blattellidae]

- ▶ German cockroaches are approximately 10-15 mm long.
- ▶ Pale brown elongated body with 2 longitudinal dark stripes on the pronotum.
- ▶ Nymphs resemble the adult cockroach but lack wings.



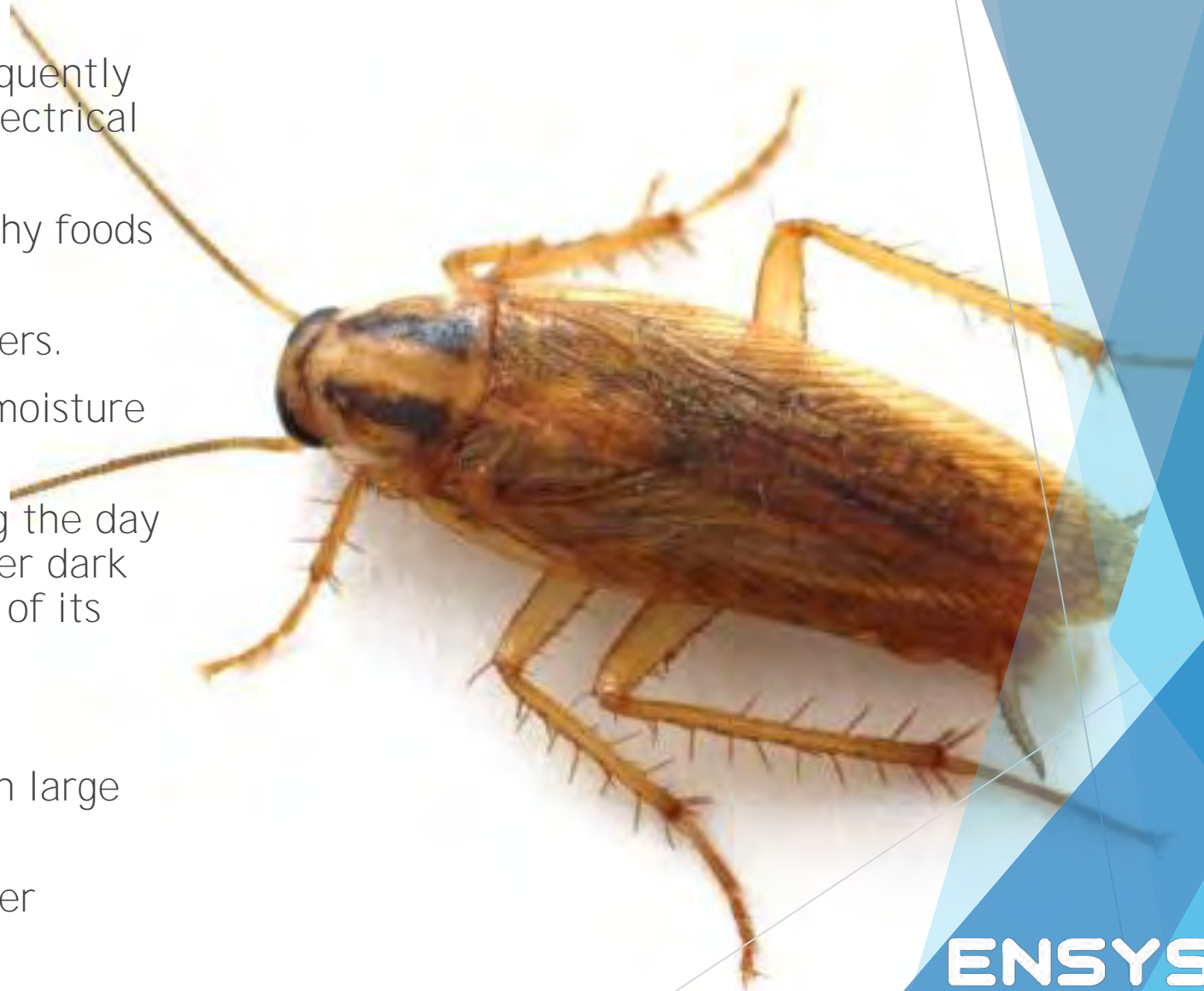
German Cockroach

- ▶ Reproduction & Life-cycle:
- ▶ Adults live 4-6 months.
- ▶ Adult female will lay 5-8 oothecae in that period containing 30-40 eggs.
- ▶ Development from egg to adult can occur in as little as 45 days.
- ▶ Nymphs hatch and undergo 6-7 moults before reaching adult stage.
- ▶ Females carry an egg capsule at the end of their abdomen.
- ▶ When the eggs are close to hatching, the females attach the capsule in a dark corner where the young can emerge safely.
- ▶ One female German Cockroach can produce up to 20,000 young annually.

German Cockroach

Habitat:

- ▶ Most common in the kitchen, frequently inside cupboards, drawers and electrical appliances.
- ▶ It eats anything but prefers starchy foods like potatoes, rice and cereal.
- ▶ Near warm areas like water heaters.
- ▶ As close as possible to food and moisture sources.
- ▶ They are nocturnal, hiding during the day in cracks and crevices or any other dark warm place. It spends about 80% of its time resting in cracks and voids.
- ▶ Fast breeder
- ▶ Social insect and is often found in large groups
- ▶ Prefer dark crevices close to water
- ▶ Omnivorous



American Cockroach

American Cockroach *Periplaneta americana*
(Linnaeus) [Blattidae: Blattidae]

- ▶ American cockroaches are about 40 mm long growing up to 55 mm.
- ▶ Their elongate body is pale to dark brown with yellow markings on the pronotum.
- ▶ Nymphs resemble the adult cockroach but lack wings.

Reproduction & Life-cycle:

- ▶ Life-cycle is 6-12 months.
- ▶ An adult female will lay 10-50 oothecae in that period.
- ▶ Each oothecae contain 12-15 eggs.
- ▶ Oothecae are dropped or glued to a substrate when laid.
- ▶ Nymphs hatch undergo 7-10 moults before reaching adult stage.



American Cockroach

Habitat:

- ▶ Live indoors and prefer warm, damp environments, humid, dark habitats.
- ▶ Commonly inhabits wall voids, under floor or ceiling areas and rubbish tips.
- ▶ Nymphs and adults occupy the same habitat and feed on starch, sugar, leather, parchment and fermented food.
- ▶ Most frequently found outside occupied buildings and shopping centres.
- ▶ They are nocturnal, hiding during the day in cracks and crevices or any other dark warm place.

Behaviour:

- ▶ Omnivorous.
- ▶ Prefers larger voids.
- ▶ Loves greasy areas.



Brown-Banded Cockroach

Brown- Banded Cockroach *Supella longipalpa*
(Fabricius) [Blattodea: Blattellidae]

- ▶ Brown-banded cockroaches are approximately 10-15 mm long.
- ▶ Their elongate body is pale brown with pale bands across the thorax and abdomen.
- ▶ Nymphs resemble the adult cockroach but lack wings.

Reproduction & Life-cycle:

- ▶ The life cycle is 6 months.
- ▶ An adult female cockroach will lay 6-12 oothecae in that period.
- ▶ The oothecae contain 10-16 eggs.
- ▶ Oothecae are glued to a substrate when laid.
- ▶ Nymphs undergo 6-8 moults before reaching the adult stage.





Brown-Banded Cockroach

Habitat:

- ▶ All areas of houses, restaurants, hospitals, offices and storage facilities.
- ▶ Nymphs and adults occupy the same habitat
- ▶ Feed on starch, sugar, leather, parchment and fermented foods.
- ▶ They can survive in drier areas, so they can be found in bedrooms, living rooms, cupboards, bookcases.

Behaviour

- ▶ Prefers to spend much of its time resting in cracks and voids.
- ▶ Most of its activity will occur at night when safe to search for food and water.
- ▶ **Doesn't require as much moisture as German cockroaches,** likely to be found in rooms other than kitchens and bathrooms.
- ▶ Will eat anything containing organic matter.





IPM, PESTICIDES & SERVICE

Part 2

Integrated Pest Management



- ▶ The basic components of IPM are:
- ▶ Identify the pest,
- ▶ Understand the biology and behavior of the pest,
- ▶ Determine if control is needed,
- ▶ Know the available control measures and evaluate their usage (risks, benefits and effectiveness),
- ▶ Implement safe and effective control procedures
- ▶ Evaluation of your control method.

Integrated Pest Management

Consider all strategies, such as:

- ▶ Remove food scraps and organic matter. Rubbish bins should be securely covered and emptied frequently.
- ▶ Food should be stored in tightly covered containers in screened cabinets or refrigerators.
- ▶ Areas underneath buildings should be kept dry and free of accessible food and water.
- ▶ Groceries, laundry, dirty clothing and furniture should be checked before being taken into a building.
- ▶ Installing physical barriers, such as insect screens, and sealing cavities and cracks in walls, closing gaps in floors and door frames.

Inspection

- ▶ What do you look for?

Look for empty or intact egg cases, cast skins, dead cockroaches or cockroach parts, faecal pellets or faecal stains. The presence of several sizes of nymphs and oothecae is an indication of a well-established colony. Searching behind skirting-boards, boxes, furniture and other common hiding places. Cockroaches are easily detected using a good torch.

Keep in mind...

Past or present pest management efforts in the building. If the previous pest control tactics included the use of insecticides that had a strong repellent effect, the cockroach infestation may have moved from its original location. In this case, you should spend some time exploring locations where insecticides were not used, like false ceilings and other areas above your head.

Take an overall look at the premises, inside and outside.

Where is food brought in? Where is it prepared? Where is it eaten?

You should check possible entry points such as around water and drain pipes under the sinks, sewer pipes, conduits for electricity or crevices in walls connecting with other infested areas.

Look, up – look down, get down on your knees!

Inspection

- ▶ Cockroaches need these resources to thrive and reproduce. Only very small amounts of water and food may be required. The resources in every habitat determine whether or not an infestation can be established and the potential infestation level.

Water - A waxy coating on cockroaches' body helps prevent moisture loss, but water is necessary for their survival. One drop of water per day is all a cockroach needs. They can get water from condensation on pipes, small leaks, moist sponges and even soaked wood. They can easily meet their water requirements from moistened food.

Shelter - Cracks and crevices are places where cockroaches live during the day. They prefer wood and paper in their living quarters rather than metal surfaces. Their flat body allows them to squeeze into places where they can touch the surfaces above and below at the same time. The warmth around motors of dishwashers and refrigerators is attractive, especially if there is a drip pan under the refrigerator which provides water.

Inspection

Food

- ▶ Cockroaches eat almost anything: crumbs, hair, fingernail clippings, spots of grease, soiled clothes, pet fur and dead insects (even dead cockroaches).
- ▶ They will cannibalise their own young and egg cases if food becomes scarce. Food that is high in protein or has a significant moisture content is the most attractive to cockroaches.
- ▶ If pet food is left in a dish overnight, you are feeding your cockroaches. They prefer starchy and sugary materials. They sip milk and nibble at cheese, meats, pastry, grain products, sugar and sweet chocolate.
- ▶ They also feed on cardboard, book bindings, ceiling boards containing starch, the sized inner lining of shoe soles.
- ▶ Their own cast-off skins, dead and crippled cockroaches, fresh and dried blood, excrement.
- ▶ The fingernails and toenails of babies sleeping or sick persons.



Pesticides - How do they work?

- ▶ Heavy infestations of cockroaches can be dealt with by pesticide control measures, followed by environmental management to deprive the insects of food and shelter.
- ▶ All pesticides should be placed where the cockroaches live and breed, which speeds up the effectiveness of the service.
- ▶ The Pesticides used to manage Cockroaches may take the form of dusts, fumigants, baits or liquid formulations and have a residual allowing them to work over a period of time. Once the Cockroaches come in contact with the pesticide they will gradually be eradicated, however some Gel Baits are slow acting to permit the active to be transferred back to the nest.
- ▶ When using gel baits, to work, the Cockroaches must feed on the bait containing the pesticide. This is the reason why the customer may not see a change straight away and should wait the seven day period for desired results.
- ▶ Cockroaches are difficult to control with pesticides for several reasons, one of which is that they may become resistant to commonly used actives. Pesticide control gives only temporary relief and, wherever possible, it should be accompanied by environmental sanitation and house improvement.

Pesticides - How do they work?

- ▶ Most liquids used for cockroach control are Synthetic Pyrethroids.
- ▶ One characteristic of using Synthetic Pyrethroids is that when a cockroach encounters the pesticide, it becomes more excited and active. You may then see cockroaches during the day. This change indicates they have been affected by the pesticide.
- ▶ Some residual Pesticides remain active to kill pests for several months after application. They work by keeping a toxic pesticide residue on the surface that the insect will contact. For this reason, they need to be applied to harborages.
- ▶ Contact pesticides, control the pest on contact. They are applied directly to the insect which is killed after it comes in contact with the insecticide. Very little toxic residue remains on a surface.
- ▶ Stomach poisons are pesticides eaten by an insect so that the poison enters the stomach and then is absorbed into the body. Many baits are stomach poisons.

Pesticides - How do they work?

Dusts

▶ Synthetic Pyrethroid

- ▶ Dusts are slow-acting but can give long lasting control
- ▶ They are most useful for the treatment of wall voids, false ceilings other cracks and crevices and other cockroach hiding places that cannot easily be reached.
- ▶ Do not apply dusts in open areas or where food and utensils are kept.
- ▶ Dusts disperses exceptionally well and will penetrate deep into cracks and crevices.
- ▶ Heavy dust deposits will repel or drive away cockroaches and cause them to move to untreated areas or less accessible places.
- ▶ Dusts should not be applied to wet surfaces as this reduces their effectiveness. When used together with residual sprays, dusts should be applied only once the sprayed surfaces are dry.

Pesticides - How do they work?

Gels & Baits

Hydramethylnon, Fipronil, Imidacloprid, Abamectin

- ▶ A bait formulation is an edible or attractive substance mixed with a stomach poison.
- ▶ One disadvantage of using baits alone is that control may be slow.
- ▶ Another disadvantage is that some products do not suppress large populations of cockroaches. Baits are an ideal companion to other types of control and work best when sanitation is good.
- ▶ Place the gel in cracks and crevices around windows, doors, and any other suspected cockroach harborage areas. Never spray a liquid insecticide where gel has been applied. Liquid insecticides used in the vicinity of gels will repel cockroaches from the gel.
- ▶ Most gels need to be alternated due to resistance concerns.

Equipment

The following equipment will be required to carry out a cockroach service

- ▶ Torch
- ▶ Screwdriver
- ▶ Power drill with 12mm masonry and wood drill
- ▶ Hand drill with 5mm drill
- ▶ Bait Application Gun
- ▶ Duster
- ▶ Hand-sprayer
- ▶ PPE
- ▶ Ladder



Service - Operational Procedure

Service areas;

- ▶ Internal areas
- ▶ Roof voids
- ▶ Under the Building (except if on a slab)
- ▶ Outside areas

Application

- ▶ Areas to be treated include kitchens, galleys, behind and along skirting-boards, in and around sinks, in or under cupboards, under chairs and tables, in utility cabinets, near refrigerators, under loose floor coverings, food preparation areas, ducts, pipes and manholes. Food storage areas in restaurants and other commercial establishments should be treated.



Service - Frequency of Treatment

- ▶ How long the deposits of pesticides remain effective depends on a number of factors, such as the thoroughness of application, the speed of re-infestation, the pesticide used, the dosage and formulation, the type of surface to which it is applied, the temperature and humidity, and the amount of wearing or rubbing off that occurs. Pesticides generally last longer on painted than on unpainted surfaces and longer on treated wood than on brick or block surfaces.
- ▶ Frequent washing of a treated surface or coatings of dust or grease can render an pesticide useless. A single treatment rarely results in sufficient control. For most species, additional treatments may be necessary at monthly intervals to kill newly hatched nymphs or to prevent reinfestation.



Service - Inside the Home

- ▶ Kitchen, bathroom-toilet, laundry
- ▶ Other rooms (only if infested by cockroaches)

Kitchen, laundry and bathroom-toilet service

Apply chosen product:

- ▶ Back of cupboards
- ▶ To the frames of cabinets so it cannot be seen or come in contact with any of the contents or the occupants of the house.
- ▶ To sinks and pipes on the underside of sink.
- ▶ To all pipe joints.
- ▶ To the join between toilet cistern and bowl.
- ▶ To the base of toilet at the rear.
- ▶ Behind the tap capping of baths and spas.

Service

- ▶ Gel Bait or dust is applied to electrical appliances as follows:
- ▶ Fridge and freezer: Rear of the appliance and apply around the edge including the motor. If there is an infestation around the magnetic strip on the refrigerator door apply Gel Bait under the strip.
- ▶ Dishwasher: Remove the kick plate and apply along the internal edge of the kick plate.
- ▶ Microwave Oven: Gain access to the underside of the microwave and apply bottom sides and front.

Application of Dust - It may be necessary to drill the cupboard kickboard - if so, permission must be given by client.

- ▶ Drill a 5mm hole near top of kickboard.
- ▶ Inject dust through the 5mm hole with hand duster.
- ▶ Plug 5mm-hole with acrylic sealant.
- ▶ Clean up drilling waste with your dust-pan and brush.



Service

Dust to Cavity Walls

- ▶ Cavity walls may be treated if infested or suspected of harbouring cockroaches.
- ▶ Drill a 12mm hole mid height in the suspected area.
- ▶ A number of holes may need to be spaced along the wall area (max spacing 2m).
- ▶ Apply insecticide dust using duster with a wall cavity nozzle.
- ▶ Plug holes using mortar or other suitable sealants.

Application of Liquids

- ▶ Apply materials to cracks and crevices where cockroaches live. These areas include cracks around pipes under sinks, around toilet bowls, around baseboards, and around appliances. Never spray around or into electrical outlets. Avoid spraying food preparation surfaces. Do not touch surfaces until dry (up to 4 hours). Some materials may damage carpets, tile, or plastics.
- ▶ Check the label before using any material on these surfaces.



Service

Application of Gel Baits

- ▶ An inspection, with the customer, will help you in determining where the infestation is and where best to apply product.

Roof

Application of Dust

- ▶ Before entering roof void check for exhaust fans or ceiling vents, either close vents or turn on exhausts fans. This will prevent dust from the ceiling void entering the living area of the house.
- ▶ Move to the point furthest from the roof access point, after partially or fully closing the access hole. This is to prevent dust entering the living area.
- ▶ Apply the dust using a sweeping motion while moving back to the access point.
- ▶ Ensure to dust areas where cockroaches are nesting such as around stored items



Service - Step 2 Outside

Application of liquid insecticide

- ▶ Apply to cracks and crevices where cockroaches are suspected of living or entering the home, such as door thresholds and window frames. A perimeter treatment along the base of the foundation wall, in cracks and crevices, and at points of entry into the home can also help control the larger outdoor cockroaches.
- ▶ Inspect potential harbourages.
- ▶ Garage n outbuildings (cross contamination)
- ▶ Around drains (not in the drain).
- ▶ Garbage areas
- ▶ Check garden beds, particularly where mulch has been used.
- ▶ Apply the pesticide using your pressure sprayer.
- ▶ For an environmentally responsible treatment, do not treat areas that are not infested.

Service

Documentation

- ▶ Complete the company provided documentation and ensure the client understands the treatment proposed and they have signed the document prior to commencing any works.
- ▶ Document any additional recommendation for the property owner to carry out.

Recalls

- ▶ Record details of any calls from a client on the job file, When a client calls to report a continuing problem with cockroaches, ask the client;
- ▶ The extent of the problem and the location.
- ▶ Has there been a change since the last service?
- ▶ Is it within the warranty period? If not explain to the client that there is a time period in which the ingredient remains active. A further application may be necessary to reduce the numbers or remove the problem.
- ▶ Has the seven day time period elapsed to allow the active ingredient to have had a significant effect? If not explain to the client that the cockroaches must feed on the bait containing the insecticide and that it is important to wait the seven day period.



Customer Service

Part 3

Customer Service

Advise the customer

- ▶ Remove as much as possible from the kitchen, bathroom and linen cupboard for a more thorough treatment.
- ▶ To cover food, cooking utensils, toothbrushes, children's soft toys and other items that people or pets may put in their mouth.
- ▶ At a minimum move everything to the centre of shelves in these areas.
- ▶ Keep pets away until the pesticide is dry

Precautions to take when applying pesticides

- ▶ Ensure client stays away when mixing and applying pesticides.
- ▶ Make sure client avoids contact with the pesticides.
- ▶ Instruct client before reoccupying a building after treatment is finished, open doors and windows to let fresh air blow through and remove any fumes.
- ▶ Care should be taken to avoid food contamination. Avoid treating areas where children may come into contact with the residue.
- ▶ Some formulations may stain. Information should be obtained on this subject before treatment is carried out.

Customer Service

Complaint:

More cockroach activity than before the service

Answer:

- ▶ The reason for this is that the gel applied during the service is drawing the cockroaches from the hiding places resulting in the cockroaches eating the gel and dying off.

Complaint:

Have an ant problem after being treated for cockroaches

Answer:

- ▶ The reason for this is probably that the dead cockroaches are attracting the ants, so by cleaning up the dead cockroaches as they find them, this takes away the attractant to the ants. Again, empathise with the client that it is not pleasant, but it is not the service that is attracting the ants but the dead cockroaches.

Occupational Health and Safety

Insecticide Handling, Storage and Disposal

- ▶ Insecticides are valuable pest management tools, and like any tool, they must be used carefully and responsibly. Read the label to determine the best way to handle insecticides.
- ▶ As soon as insecticides arrive on your property, store them in a locked and posted cabinet where children cannot get to them.

Things to Remember

- ▶ Read and follow all label directions.
- ▶ Store insecticides only in the original, labeled containers.
- ▶ Wear appropriate protective gear as directed by the label.
- ▶ Never reuse an insecticide container for any purpose.



Occupational Health and Safety

Protective Clothing Care-

- ▶ When working with insecticides, you should wear clean clothing daily. Launder insecticide contaminated clothing separately. Clothing that becomes wet from insecticides should be removed immediately! Fast action will reduce your exposure to the insecticide.

Wash Up-

- ▶ Good personal hygiene is essential. Soap and water is cheap insurance against insecticide contamination. Wash your hands and face often when working with insecticides. Never smoke, eat, drink or use the toilet after handling insecticides without first washing your hands! Shower after using insecticides and before changing into clean clothes.





Flushing Agent



READ SAFETY DIRECTIONS BEFORE OPENING OR USING

HYMENOPHOR™ ULTRA

GRANULAR ANT AND COCKROACH BAIT

ACTIVE CONSTITUENTS: 0.1 g/kg FIPRONIL

GROUP 2B INSECTICIDE

Kills common household ants and cockroaches in domestic, industrial, institutional situations and/or other locations as per the Directions for Use.

ENSYSTEX AUSTRALASIA PTY LTD
ABN 53 102 221 965
Unit 3 The Junction Estate
4-5 Junction Street Auburn NSW 1444
www.ensystex.com.au

CUSTOMER SERVICE 13 35 36
EMERGENCY RESPONSE (ALL HOURS) 13 35 36

Contents: **450 g**

APVMA Approval No. 65835/65688
TradeMark of ENSYSTEX and used under
licence by ENSYSTEX

DIRECTIONS FOR USE:

Restrictions
DO NOT apply to a wet ground surface or to areas that are washed or irrigated, or if rain is likely within 24 hours of application.
DO NOT use with other insecticides or near where they have been applied.

SITUATION	PEST	RATE	CRITICAL COMMENTS
Outdoor perimeter treatment around structures	Ants	1-2.5 g per linear metre	Sprinkle evenly in a 30 to 60 cm band adjacent to the foundations of the building, along driveways, paths, gardens and around trees. For best results apply when ants are most active, usually late afternoon. Follow-up visits should be made to inspect bait placement. Reapply as necessary.
Broadcast application		1 g per m ²	Apply by shaking uniformly over lawns, gardens and other non-crop areas.
Ant mounds		20 g per colony or mound (approx 2 tablespoons)	Sprinkle around each mound (DO NOT use flood utensils). For best results do not apply directly to the mound, nor disturb the ants or mound.
Indoor use	Ants and cockroaches	10 g per crack or crevice (approx 1 tablespoon)	DO NOT use in areas accessible to children. Indoor application is limited to inaccessible areas such as cracks and crevices, wall voids and crawl spaces in commercial and residential areas. Apply by shaking into cracks or crevices (DO NOT use flood utensils). Remove any loose or excess granules.
		1-2.5 g per m ²	Apply to crawl spaces inaccessible to children and pets.

NOT TO BE USED FOR ANY PURPOSE, OR IN ANY MANNER, CONTRARY TO THIS LABEL UNLESS AUTHORISED UNDER APPROPRIATE LEGISLATION

ENSYSTEX
LEADING INNOVATION IN PEST MANAGEMENT

Granular Bait

ENSYSTEX®
THE INNOVATORS



Fast Knock Down



ENSYSTEX[®]
 THE INNOVATORS



BITHOR® DUAL ACTION INSECTICIDE

Reg. No. L9717 Act/Wet No. 36 of/van 1947
Namibian Reg. No. N-AR1729

READ ATTACHED PACKAGED LEAFLET BEFORE USE
KEEP OUT OF REACH OF CHILDREN AND ANIMALS

GROUP 3A | 4A INSECTICIDE

A suspension concentrate for control of pests indoors and outdoors in and around industrial, institutional and public structures and buildings including food handling establishments.



WARNING

ACTIVE INGREDIENTS / AKTIEWE BESTANDDEEL:

Bifenthrin (pyrethroid).....45 g/L
Imidacloprid (chloro-nicotinoyl).....55 g/L

Net Volume / Netto Massa:

1 L

UN number: 3082

Batch No.:

Date of Manufacture:

REGISTRATION HOLDER / REGISTRASIEHOUER:
ENSYSTEX SOUTH AFRICA (PTY) LTD
Company Reg. No. 2008/0021907
Building 3, The Barns Business Park
12A Jet Park Road, Jet Park, Boksburg, GAUTENG 1469
Tel: 011 307 9782
www.ensystex.co.za

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ENSYSTEX®



L/A-SA-CHMB1017 4.02 06.23 T

Resistance
Management
They won't get
comfortable

ENSYSTEX®
THE INNOVATORS



General Initial and Follow Up

They will move
Out permanently!



ENSYSTEX®
THE INNOVATORS

Gel Baits



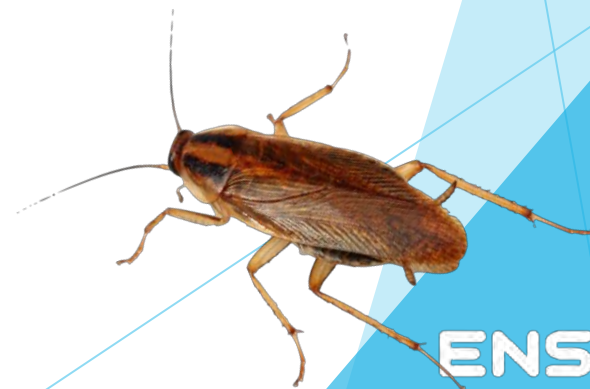
Implications for Bait Placement



Implications for Bait Placement



Implications for Bait Placement



Implications for Bait Placement

FOOD

BAIT

BAIT

BAIT

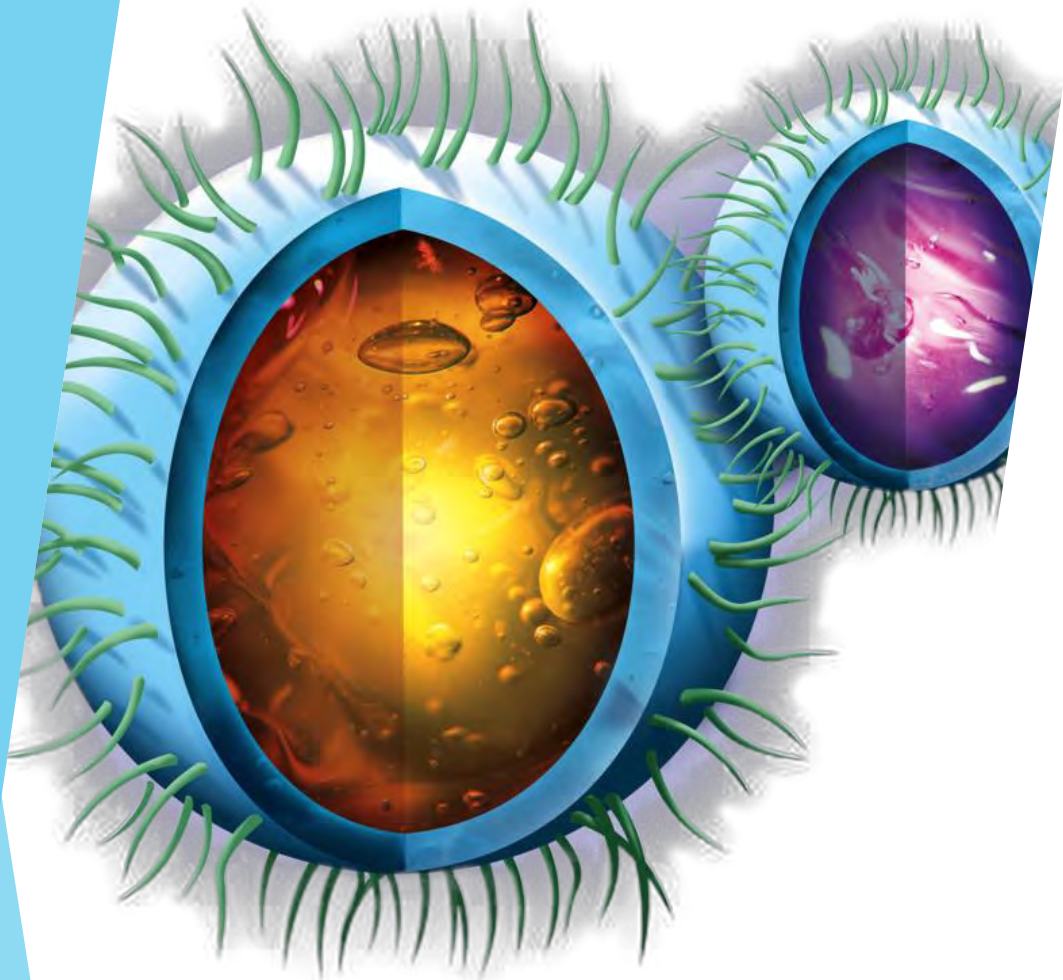
BAIT

BAIT

BAIT



Durier & Rivault, 2008. Learning and foraging efficiency in German cockroach. *Animal Cognition* 3.



ATTRATHOR Targeted Insecticide

**ACTIVE
CONTROL**

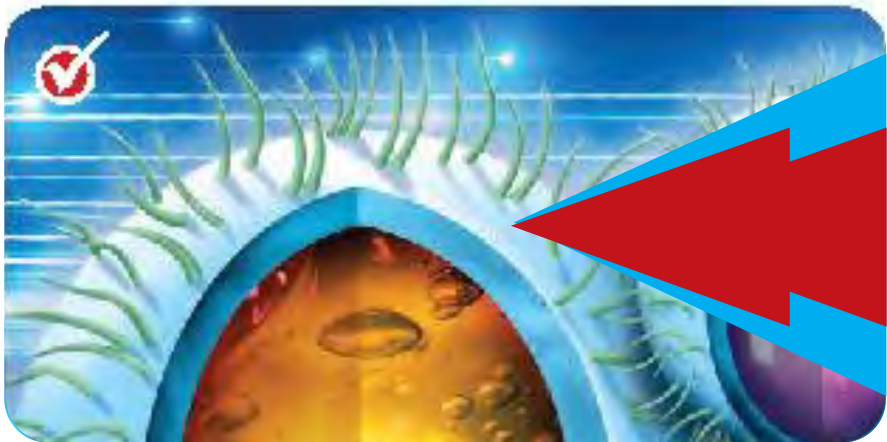
Residual film containing Quick-release Insect Attractant Micro-capsules™



Applied as a long lasting surface spray

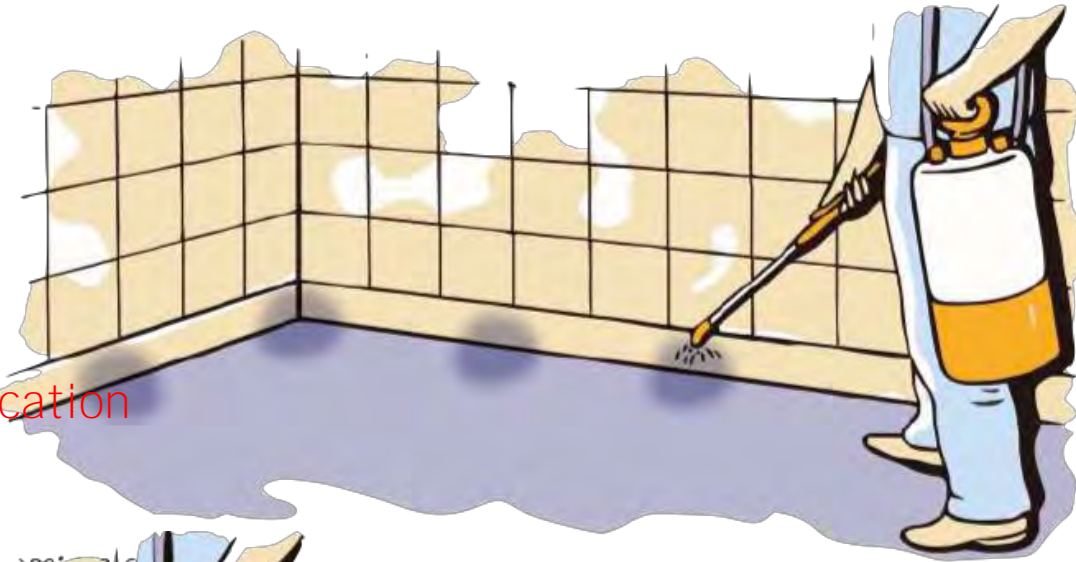


**PASSIVE
CONTROL**

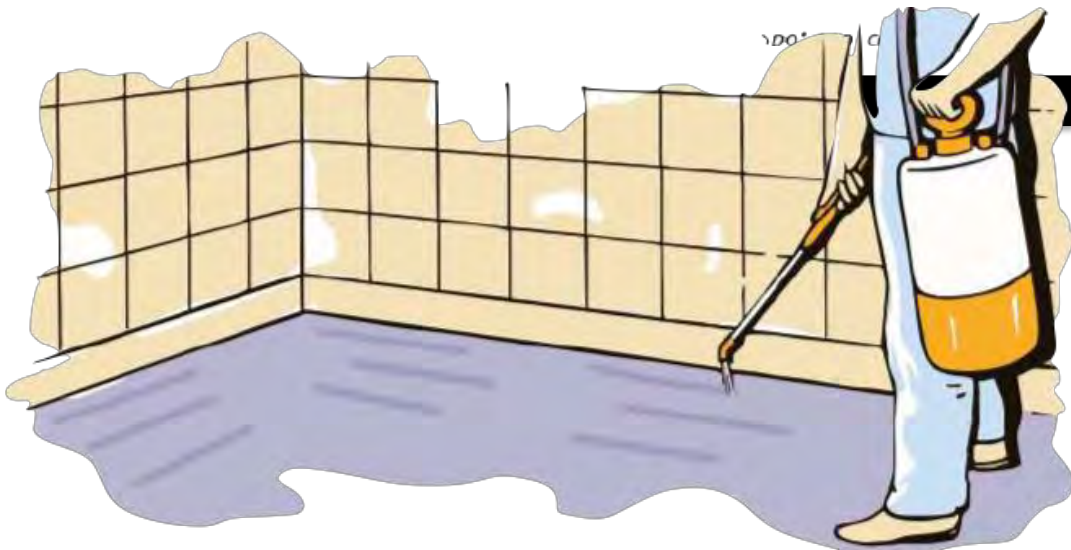


Creating the Target Zone

Spot Application

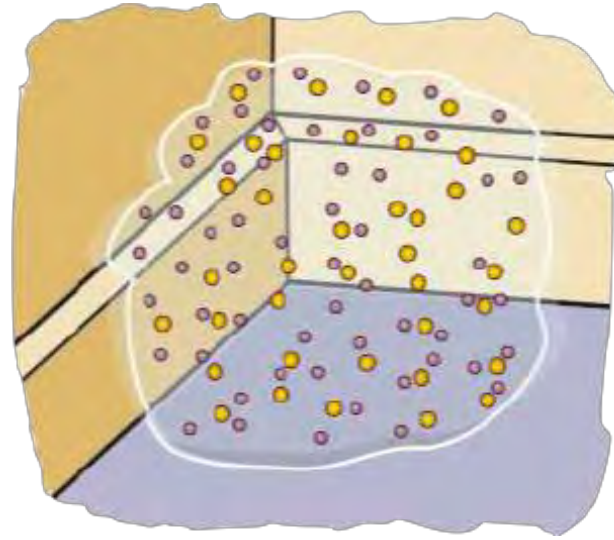


Strip Application - 15 cm

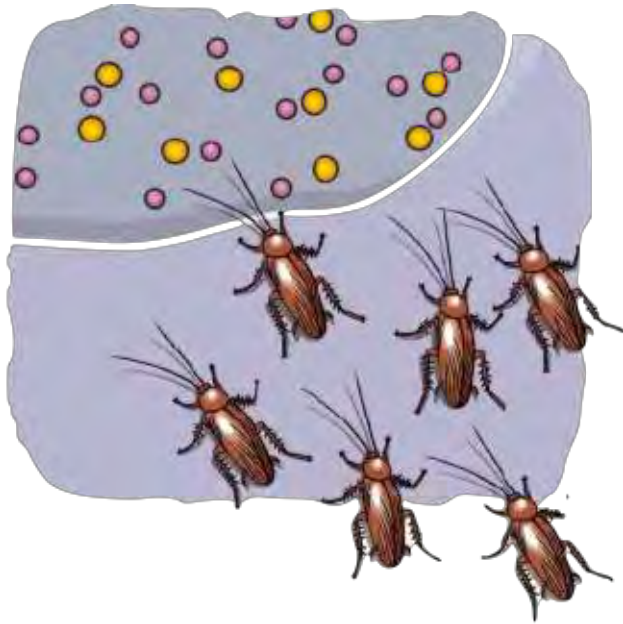


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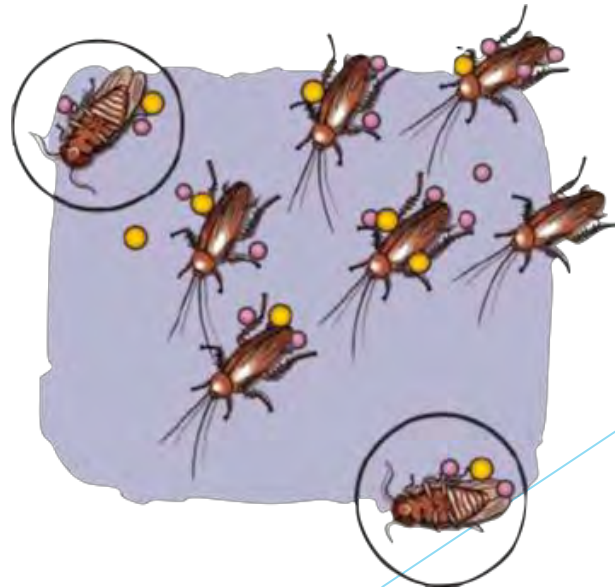
Creates active encapsulated film on surface

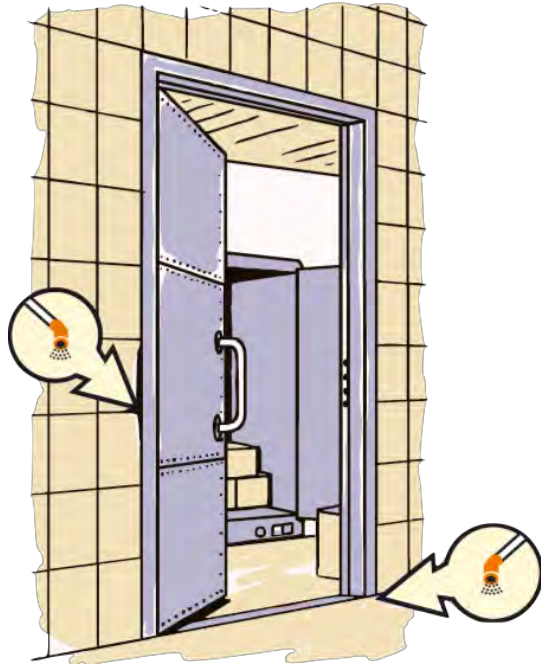
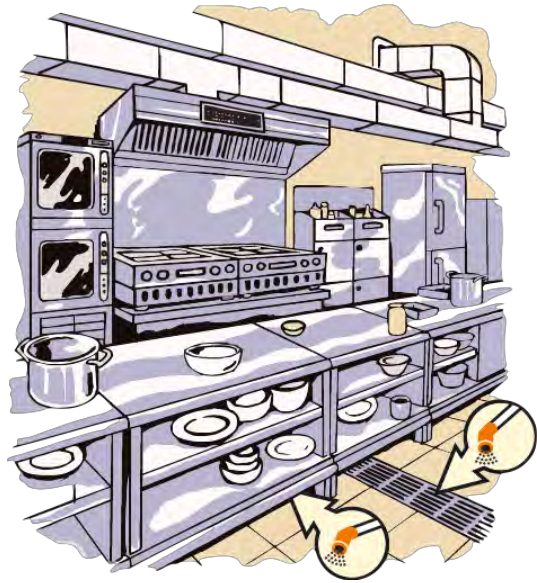


Attractant lures cockroaches to the targeted film



Direct kill and Viral Transfer Effect™









Surrender

Any Questions

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