IF COCKROACHES ARE YOUR PROBLEM, BAYER HAS THE SOLUTION.

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Cockroaches pose a serious threat to human health. They emit allergens that worsen asthma symptoms and transmit disease pathogens that cause diarrhea, typhoid fever, dysentery, and food poisoning, among other ailments. Cockroaches are also loathed by most people and invoke a stigma that creates the perception that infested homes or businesses are dirty and disgusting. This reputation can have a devastating effect on a restaurant owner's business, an apartment manager’s occupancy rate and a homeowner’s self-esteem.

Due to their negative impact on human health and well-being, cockroaches are deserving of the Pest Management Professional’s best efforts to eliminate them from customers’ homes and businesses. That’s why Bayer Environmental Science makes a whole arsenal of insecticide baits, sprays and dusts so you can custom-design IPM programs that work fast, even in sensitive environments. So combine your expert knowledge and service with Bayer’s advanced technology, because you and your customers deserve the very best.

INTEGRATED PEST MANAGEMENT FOR COCKROACHES (IPM)
IPM is critical to ensuring customer satisfaction, building your business and enhancing your company’s reputation.
INTEGRATED PEST MANAGEMENT

INSPECTION
Look for cockroaches, the signs they leave behind and conditions conducive for cockroach infestations. Signs of a cockroach infestation include the presence of fecal matter, egg cases, cast skins (exoskeletons), carcasses and live insects. This array of body parts and debris attracts roaches to the area. Although cockroaches will “nest” together in large numbers, they are not social insects and will cannibalize each other when food becomes scarce.

A service report that includes a checklist is a great way to:
- Save time
- Record your findings
- Make sure nothing is forgotten
- Communicate with your customers

Cockroaches normally hide in warm, dark and hard-to-reach areas near food and water. They tend to be nocturnal but may be seen during the day. Cockroaches hide in small cracks, crevices, wall voids, furniture, electronic equipment and appliances, utility boxes, and many other places, so plan to search high and low.

THE FOLLOWING INSPECTION TOOLS WILL MAKE YOUR JOB EASIER:
- A powerful flashlight
- An inspection mirror with telescoping wand to deflect light and allow you to see into hard-to-reach areas
- Handheld tools, including a screwdriver, pliers and small pry bar to open equipment for better access. A utility tool like a Leatherman® contains many of these items
- Protective clothing, such as kneepads, gloves, a bump cap and coveralls; cockroach work can be dirty work, and if you’re properly dressed you have a better chance of success
- A stepladder; it’s impossible to inspect areas such as drop ceilings without this
- A specimen bottle for collection purposes
- Tool kit or utility belt to carry equipment
- Sticky traps that catch cockroaches help you identify problem areas and save valuable time by allowing you to concentrate your efforts
- A flushing agent such as Kicker® may be used to chase roaches out of hiding while inspecting
- Maxforce® Roach Bait Stations are more than control devices; their transparent red lids allow for inspection of cockroach feeding activity

PEST IDENTIFICATION
Be able to identify and understand the biology and behavior of all the common cockroach species in your area, as this information will enable you to save time and do a better job. On pages 9-10, we feature a “Common Cockroach Species” identification chart, which can help you. If you find a cockroach you can’t identify, capture a specimen and seek assistance in proper identification.

RECOMMENDATIONS
Your IPM action plan should incorporate effective non-chemical and chemical control methods that best fit the environment you’re protecting, as well as the needs of your client.

TREATMENT
Pesticide applications work best when applied directly into cracks, crevices and voids where cockroaches hide. The next best places to treat are the travel routes between where cockroaches hide and where they find food and water. These foraging routes are normally along edges and corners of walls and along lines that are easy for cockroaches to follow, such as pipes, utility lines, table legs, etc.

Large accounts, such as big commercial kitchens, may seem to have a countless number of possible hiding spots. For these environments, world-renowned cockroach expert Dr. Austin Frishman recommends “Zone Management” as a strategy to make large jobs more manageable. Simply divide the account into smaller zones and tackle each zone, one at a time. When you identify different zones, keep in mind that cockroaches prefer to stay close to food and water sources; then inspect and treat each zone accordingly.

Pay special attention to the characteristics of the micro-environment where cockroaches live. Keep the questions and factors below in mind when you choose different control methods because knowing what products and procedures work best in different micro-environments is key to eliminating cockroach infestations.
- Are the surfaces dirty or covered with grease?
- Are they porous? Will the surface absorb liquid applications, exposing crawling pests to less insecticide?
- Is the area washed regularly? Will washing remove contact insecticides or reduce the palatability of bait?
- What’s the temperature? Will high heat or cold affect the application?

NON-CHEMICAL CONTROL PROCEDURES
- Improve sanitation to remove alternative food sources, which will result in less competition for baits, plus residual contact insecticides are typically more effective on clean surfaces
- Repair and eliminate moisture problems
- Reduce clutter to eliminate hiding places and provide better access for inspection and treatment
- Seal cracks and crevices to eliminate hiding places and entry points
- Store food in cockroach-proof containers
- Avoid the use of paper and cardboard storage containers
- Empty trash containers frequently, and recommend tight-fitting lids
- Pick up pet food when pets are done eating
- Sticky traps are effective monitoring tools that catch cockroaches and identify problem areas; however, they do not effectively reduce cockroach populations
- Vacuum live cockroaches to crash the population

FOR OUTDOORS OR CONTROL OF PERIDOMESTIC COCKROACHES THAT COME IN FROM OUTSIDE:
- Seal cracks and crevices to eliminate entry points
- Trim trees and shrubbery away from the structure to prevent easy access
- Ensure all windows, doors and screens fit tightly, and install weather stripping or door sweeps as necessary
- Remove debris that attracts and provides roaches with safe harbor near the structure, such as leaf litter, heavy mulch, rotting wood and wood piles

EVALUATION AND CUSTOMER COMMUNICATION
Let your customer know what you are doing, what results to expect and what they can do to help control and prevent future cockroach problems.

“If you’re properly dressed you have a better chance of success” — Dr. Austin Frishman

Call 1-800-331-2867 or contact your local representative for information to order.

“Roachformation” door hangers, available from Bayer Environmental Science, are designed to help you educate customers about what they should and should not do to help eliminate cockroaches.
Call 1-800-331-2867 or contact your local representative for information to order.
BAITS
Maxforce baits are the number one choice of professionals for controlling cockroaches. They have the ability to eliminate inaccessible populations due to the exclusive Domino Effect™, a delayed action kill that allows foraging cockroaches to take bait back to the colony—wherever it may be hidden. Maxforce baits also have the advantage of being less intrusive and more convenient for customers because less advanced preparation is required before treatment, and the residual effectiveness lasts up to one year or until the bait is completely consumed. Baits are also an ideal choice for sensitive areas because less pesticide is applied to the environment, compared to other formulations.

- Maxforce FC Magnum Reach Killer Bait Gel contains the active ingredient fipronil and is overall the most effective cockroach gel bait available. It provides the fastest and most complete control of the most finicky German cockroaches, as well as excellent control of large cockroach species. The formula is Simply Irresistible™ to cockroaches. However, Maxforce FC Magnum features an innovative ContactX™ technology that’s so powerful, cockroaches no longer need to consume the bait to die—they simply need to touch it.

- Maxforce Roach Bait Stations are available with the active ingredient fipronil or hydramethylnon. The station design is child resistant, making them ideal for use in sensitive areas. The easy peel-and-stick adhesive allows for easy application in out-of-the-way places, and the transparent red lid allows you to inspect the station for bait consumption and whether it needs to be replaced. The station also helps protect the bait from dust, dirt and water for superior control in harsh environments.

- Maxforce FC Large Reach Bait Stations contain the active ingredient fipronil in a bait station that is specially designed to control large cockroaches. Each station contains 2.75 grams of bait to accommodate the ferocious appetite of large peridomestic roaches.

- Maxforce Granular Insect Bait with hydramethylnon is a broad-spectrum granular bait that controls cockroaches, crickets and other pests. It can be spread over large outdoor areas, used as a perimeter treatment or applied indoors as a crack and crevice treatment.

DATA DERIVED FROM LABORATORY RESEARCH PERFORMED AT THE BAYER ENVIRONMENTAL SCIENCE DEVELOPMENT AND TRAINING CENTER.
Cockroach Insecticides

Residual Contact Sprays
Residual sprays are economical, fast-acting and easy to apply. They may be used as crack and crevice, spot or broadcast applications indoors and around the outside of structures. They are also broad-spectrum and will control a wide variety of pests including cockroaches.

- Tempo® SC Ultra, with more than 130,000 Beta-Crystals™ per square inch, offers 14 times more coverage than microencapsulated products and is available in suspension concentrate and wettable powder formulations. Labeled for use where you need it, Tempo Ultra with beta-cyfluthrin works exceptionally well on porous surfaces.
- Suspend® SC, with the active ingredient deltamethrin, can be used indoors as well as outdoors as a perimeter application and on turf grass and landscape ornamentals. Suspend has no odor, leaves no visible residue, doesn’t clog spray equipment, won’t be absorbed into porous surfaces and provides fast knockdown and long-term control.
- Kicker® contains 6 percent natural pyrethrum and provides very fast knockdown, improved control of pyrethroid resistant strains and excellent flushing action, making it an excellent inspection tool and tank mix product. Kicker also has a very short residual, as when used alone, it’s ideal for customers who do not want residual insecticides. When residual control and flushing action is needed, simply mix Kicker with Tempo Ultra or Suspend SC for dual action.

Dusts
Insecticide dusts are effective tools that provide excellent penetration into cracks, crevices and large voids. Dust applied properly in a thin layer will deliver a long, effective residual, even on porous surfaces, and make harborage uninhabitable by cockroaches for long periods of time.

- DeltaDust® is 100 percent waterproof, making it an economical and efficacious way to treat cockroaches and other pests in wet areas, with a residual of up to eight months. DeltaDust is also one of the few products labeled for application directly into drains that lead to sewers, a common place to find cockroaches.
- Drione® is a silica-based desiccant dust with natural pyrethrum, providing quick control and a residual of up to six months without staining surfaces or emitting offensive odors. Drione dust is also a powerful flushing agent.
- Tempo® 1% Dust contains 1 percent cyfluthrin, is ready-to-use, has low-odor and is non-staining.

“Every technician, at some point in their career, should experience the satisfaction of seeing white cockroaches running from their hiding places, covered with a light coating of Drione dust.” — Gordon Morrison, Maxforce Insecticides Market Manager

Granules
A broad-spectrum granular contact insecticide is also an effective solution for wide open spaces outdoors with visible cockroach activity, as well as hard-to-reach areas at the base of thick ground cover around the perimeter of structures.

- DeltaGard® G with deltamethrin, features small particles that fall through mulch, leaf litter, and vegetative cover to treat hard-to-reach areas. DeltaGard has no odor and is labeled for perimeter and entire lawn treatments, offering quick, long residual control. It’s a good option when rain is expected, as water helps the product disperse and penetrate deeper.
## COMMON COCKROACH SPECIES

Cockroaches appear flat when viewed from the side and can hide in small cracks and crevices. They have long threadlike antennae that may protrude from their hiding places, allowing them to sense their surroundings while remaining hidden. In addition to eyes, additional sensory organs called Cerci, which are antenna-like, protrude from the tip of the abdomen. Their claw-like tarsal segments, or feet, may have sticky footpads that help them climb smooth surfaces such as glass, and many species can run very quickly when disturbed. Most species have wings and don’t fly; however, some are strong fliers.

<table>
<thead>
<tr>
<th>Egg Case</th>
<th>Nymph</th>
<th>Adult</th>
<th>Description</th>
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</table>
| ![Egg Case](image1) | ![Nymph](image2) | ![Adult](image3) | **German Cockroach** (*Blattella germanica*)  
- Adults average 1/2 to 5/8 inches in length  
- Nymphs average 1/16 to 1/2 inch long  
- Tan to light brown; two longitudinal stripes on the pronotum  
- Females are larger than males and may have an egg case protruding from the end of their abdomen  
- Egg cases contain 30 to 40 young; each egg develops into an adult within 50 days. |
| ![Egg Case](image4) | ![Nymph](image5) | ![Adult](image6) | **American Cockroach** (*Periplaneta americana*)  
- Adults average: 1 1/4 to 2 1/8 inches in length  
- One of largest species to infest structures (also known as water bugs or Palmetto bugs)  
- Found in northern and southern climates; thrive outdoors in the South  
- Males’ wings extend beyond the abdomen; females’ wings do not  
- Prefer dark, moist areas near food sources and may enter structures through sewer pipes and floor drains  
- Sink harbors in voids, including monastery block voids, and may travel in areas above drop ceilings  
- Males can fly and are attracted to artificial light. |
| ![Egg Case](image7) | ![Nymph](image8) | ![Adult](image9) | **Australian Cockroach** (*Periplaneta australasiae*)  
- Adults can grow up to 1 1/4 inches long  
- Closely resembles American cockroach in size and color  
- Has pale yellow stripes at the base of wing pads and the margin of the pronotum  
- Not commonly found indoors but will be found there when temperatures are high  
- Can be brought into accounts on indoor plants and may be found everywhere American cockroaches are active (except avirous)  
- Also infest greenhouses, coops and commercial accounts where conditions are suitable. |
| ![Egg Case](image10) | ![Nymph](image11) | ![Adult](image12) | **Oriental Cockroach** (*Blatta orientalis*)  
- Adults grow up to 1 inch in length  
- Distinctively shiny and black  
- Males’ wings take up 2/3 the length of the abdomen; females’ wings take up 1/4 the length of the abdomen  
- Does not fly and has difficulty climbing smooth surfaces  
- Susceptible to dehydration; seeks moist areas in which to hide  
- Usually found in basements, crawl spaces and the lower floors of an account  
- In southern climates, may be found outdoors hiding in leaf litter, beneath logs, and mulch. |
| ![Egg Case](image13) | ![Nymph](image14) | ![Adult](image15) | **Smokybrown Cockroach** (*Periplaneta fuliginosa*)  
- Adults range from 1 1/4 to 1 1/2 inches in length  
- Easily recognized by its uniform mahogany brown color  
- Found outdoors in the South  
- Hides in mulch, leaf litter, ground cover, woodspiles and tree bark for protection against dessication  
- Often found dead indoors likely due to dehydration  
- Typically enters a structure through the attic and open spaces  
- Both males and females can fly. |
| ![Egg Case](image16) | ![Nymph](image17) | ![Adult](image18) | **Brownbanded Cockroach** (*Supella longipalpa*)  
- Adults average 5/8 of an inch in length  
- Similar in size and appearance to the German Cockroach  
- Rather than longitudinal stripes found on the pronotum, they have two broad brown bands on their wings  
- Infest structures across the United States  
- Prefer warmer areas but may be found in any area within a structure  
- Not generally found in kitchen and bath areas, as can be expected with German Cockroaches  
- May be found in furniture, wall hangings, picture frames, light fixtures, and drop ceilings. |
RESIDENTIAL TREATMENT GUIDE

Important Tips

1. To stop peridomestic cockroaches from entering a structure, apply Tempo SC Ultra or Suspend SC perimeter treatment around the structure and place Maxforce Granular Insect Bait just beyond the perimeter spray into cockroach harborage.

2. Use Maxforce FC Large Roach Bait Stations outdoors for control of large peridomestic cockroaches. Place stations near air conditioning units, beneath decks or near woodpiles.

Important Tip

- Be careful when applying bait stations to wall paper, painted surfaces or fine wood surfaces that may become damaged when the station is removed. A thin putty knife or spatula-like tool is helpful when removing old gel and bait station placements.
Important Tip

- Place bait stations in corners or flush against walls.
Bait stations do not adhere well to greasy, dirty or rough surfaces. Clean the surface so stations will stick or apply stations with a small spot of silicon caulk or Hercules Putty™ to help hold stations in place.

DeltaDust is ideal for high-moisture environments and may be applied directly into drains that lead to sewers.
COMMERCIAL KITCHEN TREATMENT GUIDE

[*] Cockroaches are commonly brought into an account through incoming goods. In food storage areas, place bait stations under storage racks and to the underside of shelves.

[*] Have a sighting sheet in commercial accounts and designate an IPM coordinator that will record pest related problems discovered by employees in-between visits.

Important Tip

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(+) Have a sighting sheet in commercial accounts and designate an IPM coordinator that will record pest related problems discovered by employees in-between visits.
COCKROACH TREATMENT TIPS

**Baiting Tips**
- Maxforce Gel provides faster control than stations however, stations provide better long-term control over extended periods of time.
- Don’t spray on top of bait placements and do not place baits on freshly sprayed surfaces.
- Smaller more frequent gel bait placements typically work better than larger less frequent placements.
- The size of gel bait placements should depend upon the cockroach species and the size of the infestation.
- The Maxforce Sharpshooter extension attaches to Maxforce bait reservoirs and makes it easier to treat hard-to-reach areas.
- A plastic applicator tip is the best choice when working around electrical equipment.
- Roach gel may stain some textiles and porous surfaces. Apply gel directly into cracks, crevices and hard-to-see areas if staining may be a problem.

**Spraying Tips**
- Don’t flush cockroaches in commercial accounts if you don’t want customers to see them. Avoid flushing cockroaches if a customer/occupant has asthma.
- Always use a crack and crevice tip to better control crack and crevice spray applications.

**Dusting Tips**
- Apply dust in a very thin layer; thick piles, or clumps, will repel cockroaches.
- Fill dust applicators about half full so there is ‘head space’ in the applicator. This will allow you to better shake the contents and apply smaller amounts.
- Be careful when applying dust near electrical motors or fans that may blow the dust to non-target areas.
- Save time by dusting voids and then sealing them up. You can skip these treated areas on future visits.

**Granular Tips**
- Near porches, patios, driveways, flowers gardens, sidewalks.
- Around air conditioning units, garbage receptacles, trees and wood piles.

Our commitment to you can be reflected in three words no other manufacturer can use: 
*Backed by Bayer.*
- The Industry’s Best Products
- Unprecedented Training & Support
- Superior Customer Service

General Tips
- Dress sharp, keep your equipment clean and be professional.
- Record and report sanitation issues and ongoing progress to the correct person.
- Drilling holes into walls and voids will make it easier to apply pesticides directly into cockroach harborage.
- Maintain a monitoring program. Learn how to read a sticky trap/monitor. For example, if a roach is caught on the right side of a trap, chances are it came from a hiding spot to the right of the trap. (Ask your Bayer representative for a copy of the Need to Know document entitled Reading Roach Traps…)
- Understand how cockroaches react to repellent insecticides such as Drione Dust. Use this avoidance behavior to keep roaches away from critical sighting areas and corral them into other areas where they are easier to control.
- Educate your customer on what type of results they can expect.
- Sealing cracks and crevices will help eliminate harborage areas and save time on future visits.
- Large peridomestic cockroaches normally live outdoors but may enter and infest structures. When these cockroaches are a concern, the insecticide formulations discussed in this guide can be used to stop cockroaches outside, before they enter the structure.