

Chapter 9

Insecticide Applications

Insecticides are an important tool used for cockroach control, but, to be both effective and safe to inhabitants, these insecticides must be applied properly. This chapter will explain common terminology, types of application equipment and application methods for controlling different cockroach species.

Definitions

Broadcast—Coarse spray of liquid insecticide or application of a dust insecticide over a large area; should be evenly distributed.

Band/Perimeter—Coarse spray of liquid insecticide in a wide band or strip; usually several inches (centimeters) wide. Usually around perimeter of a structure.

Spot—Application of an insecticide to a small area, usually a gel bait.

Crack and Crevice Aerosol—Insecticide application of a specialty aerosol using the application tube provided to place insecticides into voids, cavities, cracks and crevices or other small, tight areas.

Crack and Crevice—Placement of the insecticide into cracks, crevices, or seams. Applications must be made so no insecticide residue is found outside the crack, crevice, or seam.

Dusting—Thin coat of dust formulation not more than one particle thick.

Bait Station Placement—Careful placement of tamper-proof bait stations in areas inaccessible to children and pets and near existing cockroach infestations.



Figure 9-1. Squeeze gel bait into cracks and crevices where cockroaches are hiding.

Application Equipment

Bait Stations and Gel Bait Applicators Insecticide baits are available in sealed, tamper-proof plastic stations or as a gel in a syringe applicator (Figure 9-1). The adhesive tape on the bait stations can be stuck to nearly any surface. When the syringe applicator is used, the gel bait is applied as buttons or small globs (spot application) in areas inaccessible to children

and pets. Determine appropriate locations to place tamper-proof bait stations and/or gel bait based on results from sticky traps used in your cockroach population monitoring efforts.

Dust Applicators.

To deliver dusts in cracks and crevices you might need to buy a hand-operated duster (Figure 9-2). Look for a local pest control company which sells pest control supplies to the public or on the Internet. The most common types are bulb- and bellows-type dusters. Many over-the-counter dust products are sold in specially designed containers designed to deliver the dust.

Crack and Crevice Aerosols. Some aerosols equipped with a narrow application tube are available through pest control companies which sell pest control supplies, the Internet, and sometimes locally at discount or hardware stores (Figure 9-3). These aerosols have a narrow applicator tube or



Figure 9-2. A hand bellows duster can apply dusts in deep into wall voids where cockroaches live. Dusts often remain active for a long time.

straw which is inserted into cracks and crevices during application. Some of these crack and crevice aerosols consist of pure, highly concentrated insecticides dissolved in an inert carrier gas. When the insecticide is injected into a narrow crevice, the inert gases quickly evaporate, leaving only insecticide on the treated surface. These insecticide residues last longer than standard liquid insecticide residues because pure insecticide is more stable than insecticide mixed with water or emulsifiers.

Crack and crevice aerosols have been formulated with many different active ingredients because these aerosols are so safe and effective when used properly. Active ingredients include hydroprene, boric acid, silica aerogel, pyrethrum and many synthetic pyrethroids.

Ready-to-Use Sprayers. (RTU) Ready-to-use home pest control liquid formulations provide another way to apply residual insecticide sprays. These products are sold with the applicator nozzle included. They generally have a “pistol-grip” hand-pump attached to the insecticide container and a siphon tube extending to the bottom of the container. These hand pump sprayers can make most of the same liquid spray applications as the compressed-air sprayers, although they usually do not come with a crack and crevice application tube.

Aerosol Sprayers and Foggers. Surface and space insecticide applications can be made with aerosol sprayers and aerosol foggers. These aerosol products don’t need any other application equipment. **We do not recommend the use of total-release foggers for cockroach control.**

Compressed-Air Sprayers. The basic mechanical unit used by pest control technicians to apply residual sprays for insect control is the compressed air sprayer. One example is the B & G® stainless steel sprayer which has an adjustable nozzle that is capable of delivering different spray



Fig. 9-3. An aerosol with a straw tip delivers insecticide in cracks and crevices where cockroaches live.

patterns. This sprayer can be adapted for crack and crevice treatment. Compressed air sprayers are easy to use, efficient, and readily available.

Application Methods

How insecticides are applied is extremely important. Many people apply insecticides ineffectively because they either choose the wrong product, wrong formulation or wrong application method.

For example, many people use over-the-counter ant and roach aerosols and expect them to provide long-term control. These products are *contact* insecticides with little residual control. Contact insecticides kill on contact, which means you have to spray the insecticide on the insect for it to work.

Another example is when sprays are applied to baseboards rather than to cracks and crevices where cockroaches live. Because most cockroaches don’t live behind baseboards, this application will not be very effective. Instead, use a crack and crevice aerosol or a sprayer fitted with a crack and crevice applicator tool to treat areas where cockroaches are hiding.

Which insecticide formulation you choose is also very important. Many materials commonly used in home construction can adversely react with certain insecticide formulations, resulting in ineffective control. For example, emulsifiable concentrate (EC) formulations will usually penetrate into porous materials, making the insecticide unavailable to control cockroaches. Wettable powder (WP) formulations on the same porous materials will remain active on the surface of the material after the water has dried. Another example, if you decide to make an application with an EC formulation, you risk damaging some plastic materials. But, a gel bait application (which may be even more effective) will eliminate the chance of

Table 5. Formulations and application techniques for effective treatment of cockroach harborages.

Situation	Formulation	Application
Wooden floors	None	Not recommended
Wooden baseboards ^a	C & C ^b (aerosol, liquid WP or RTU)	Crack and crevice (aerosol, liquid WP, or RTU)
Vinyl baseboards ^a	C & C (aerosol, liquid WP or RTU)	Crack and crevice (aerosol, liquid WP, or RTU)
Carpets ^a	None	Not recommended
Electrical outlets, motors, compressors	Gel bait, dust, C & C aerosol ^c	Spot bait placements, dusting, crack and crevice aerosol treatment using plastic applicator
Painted drywall	None	Not recommended
Above false ceilings	Dust, tamper-proof bait stations	Dusting, bait station placements
Around or on pipes	C & C (aerosol or RTU), gel bait, dust	Crack and crevice (aerosol or RTU), spot bait placements, dusting
Wall voids	Dust, C & C aerosol	Dusting, crack and crevice aerosol application
Insulation, fiberglass	Dust	Dusting
Food storage ^d locations	C & C (aerosol, liquid EC, or RTU), gel bait or tamper-proof bait stations	Crack and crevice (aerosol, liquid EC, or RTU), spot bait placements and/or bait station placements
Appliances ^d	Dust, C & C aerosol, gel bait or tamper-proof bait stations	Dusting under and around, crack & crevice aerosol, or spot bait placements and/or bait station placements
Cabinets ^d	C & C (aerosol, liquid EC or RTU), gel bait or tamper-proof bait stations	Crack and crevice (aerosol, liquid EC or RTU), spot bait placements and/or bait station placements
Hot locations	C & C (aerosol, liquid EC, or RTU), gel bait or tamper-proof bait stations	Crack and crevice (aerosol, liquid EC or RTU), spot bait placements and/or bait station placements
Wet locations	Gel bait or tamper-proof bait stations	Spot bait placements and/or bait station placements
Greasy locations	C & C (aerosol, liquid WP or RTU), gel bait and/or tamper-proof bait stations	Crack and crevice (aerosol, liquid WP, or RTU), spot bait placements and/or bait station placements
Outdoors	Aerosol, liquid EC, or RTU	Band/perimeter and/or broadcast

^a EC formulations can react with chemicals in wood stains, carpet dyes, and vinyl, resulting in reduced insecticide activity and damage to the surface.

^b Crack and crevice

^c Because these crack and crevice products contain no water or oil emulsifiers they are ideal for treating electric motors and switch boxes. The motor housings of refrigerators and freezers are an important and overlooked place where German cockroaches find an ideal habitat.

^d Before application, remove all food and utensils and protect them from exposure to the insecticide.

damage. Table 5 gives the most effective insecticide formulations and application methods at locations where cockroaches live.

Species Specific Management

Because cockroach species have preferred habitats, you will need to target specific areas within your home for most effective control. The following will help guide your control efforts.

German Cockroaches

- Concentrate in kitchen, bathrooms, and any other room where food and/or water is readily available.
- Look for possible cockroach habitats near electrical heat sources, like refrigerator compressors and fan motors.
- Apply crack and crevice treatments and/or gel baits to all cracks, crevices, and seams where cockroach activity is observed. Preferred habitats are in cracks between, under, and behind cabinets and where counter tops touch walls and sinks.
- Examine baseboards, ceiling trim boards, and wall paneling. Apply crack and crevice treatments of liquid, aerosol, or RTU insecticides or gel bait if signs of cockroaches are found.
- Examine wall decorations, like clocks and pictures, for the presence or evidence of cockroaches. Use freezing treatments, gel baits, or crack and crevice aerosols.
- Small appliances, such as toasters and blenders, should be checked for signs of cockroaches. Gel baits, crack and crevice aerosols, or freezing are best treatments. Avoid insecticide contact with food contact surfaces.
- Examine large appliances for signs of cockroaches. Pay particular attention to areas under magnetic seals on refrigerator and freezer doors. If they are found, carefully apply crack and crevice liquid, aerosol, or RTU insecticides and/or gel baits to the infested areas. Never apply insecticides so food, dishes, or utensils can become contaminated.
- Wall, ceiling, or floor voids in kitchens and bathrooms are also favored habitats. Dusts,

crack and crevice liquid, aerosol, RTU, or gel bait applications can be used in these locations. The most likely entrance into wall void areas is through openings around pipes under the sinks. Treat and seal these openings.

- Hollow locations such as table and chair legs are important harborage because they are easily overlooked. Treat these areas similarly as for crack and crevice locations, or carefully apply small amounts of dust. Baits are also especially effective in these locations.

Brownbanded Cockroaches

- Because brownbanded cockroaches have a lower water requirement than the other cockroach species, they can be found in all rooms of the house, apartment, or building. In addition to all the locations mentioned for German cockroaches, additional locations may need to be treated.
- Check trim and framing around windows, doors, and closets. If a treatment is required, use a crack and crevice liquid or aerosol application, or gel bait.
- Examine pictures, tapestries, and other wall decorations carefully. These locations are especially common for brownbanded infestations. If infestations are found, use freezing treatments, gel or tamper-proof baits, or crack and crevice aerosols.
- Check television, stereo, radio, clocks, and other electric motors with warm microclimate areas. Use special caution when attempting treatment because of the possibility of electrical shock. Use freezing treatments where possible, and dust applied very lightly for others. Some of the crack and crevice aerosols may be labeled for use in electrical appliances as well.
- Textured ceilings are a common place for the female brownbanded cockroaches to attach egg cases. Physically remove egg cases, paint the ceiling to discourage cockroaches from returning, and apply a gel bait as a spot treatment if necessary.
- Furniture with drawers in the bedroom and living room is attractive to the brownbanded cockroach. If infestations or signs are found, treat the interior of furniture using a crack and crevice liquid, aerosol, or RTU insecticide or apply insecticidal

baits.

- Other furniture, such as chairs and couches, can also be infested. If found, apply a crack and crevice liquid, aerosol, or RTU treatment to the underside of infested furniture.
- Hollow locations such as curtain and drapery rods, table legs, and pole lights are important harborage for brownbanded cockroaches as well. Treat these areas similarly as for crack and crevice locations, or carefully apply small amounts of dust. Baits are also especially effective in these locations.

Oriental Cockroaches

Oriental cockroaches require cool temperatures, high moisture, and readily available drinking water. They can occur in many of the locations mentioned earlier for German cockroaches, but concentrate in basements, bathrooms, laundry rooms, and under the kitchen sink. Follow the same treatment recommendations as for German cockroaches plus add those listed here.

Outdoors:

- Make a band/perimeter treatment with a liquid, aerosol, or RTU insecticide to all external entry areas (especially thresholds), to the entire perimeter of basement foundation, and to other slab construction areas (garage, porches, sidewalks, and stairways).
- Reduce vegetation near the foundation of the house.
- Make a crack and crevice and/or spot treatment with a liquid, aerosol, or RTU insecticide to all exterior utilities entering the structure (telephone, cable TV, natural gas, water). Seal utility entrances.
- Reapply treatments to all exterior areas mentioned as needed during warmer months.

Inside:

- Investigate crawlspaces and basement areas containing exposed soil. If cockroaches or signs are found, make crack and crevice liquid, aerosol, or RTU applications to headers, undersides of floor joists, around vents and windows, and sill plate areas. You may also want to apply gel baits or tamper-proof bait stations.
- Make spot treatments with either gel bait or

tamper-proof bait stations underneath sinks and tubs, behind water and gas meters, around floor drains, underneath water heaters, and around humidifiers.

American Cockroaches

- Although American cockroaches are less common than the other species, they can occasionally become a problem in Nebraska dwellings. They are found in all locations where German cockroaches are found, and in some areas where oriental cockroaches are found. If signs of American cockroaches are found, follow the specific treatment recommendations given for German and oriental cockroaches.
- Some habitats are especially attractive to American cockroaches and should be specifically investigated. These areas are very warm, moist locations, such as boiler rooms, steam tunnels, heated floor drains, around hot water supply pipes, and heating ducts.
- In general, liquid, aerosol, and RTU formulations will degrade quickly under hot, moist conditions. Dust and bait applications, if made properly, will be less affected by heat and moisture and will last longer than liquid formulations.

Before using any insecticide, always read and follow all instructions given on the label. This information is not only informative and useful, but it is the law! Any use not consistent with the label is considered a violation of the law and carries with it strict penalties.