

Cockroaches

Management and IPM Actions

Cockroaches are the most important public health pest of schools, homes, restaurants, and other indoor spaces. They consume human foods and contaminate them with saliva and excrement. Additionally, cockroach feces and cast skins contain allergens that can become airborne and cause allergic reactions, asthma and other bronchial problems in persons inhabiting infested buildings.

Except for size and markings, all cockroaches are similar in overall appearance: flattened, oval shaped insects with long legs and antennae. The most common pest cockroaches in the northeast United States are the German cockroach (*Blattella germanica*), the American cockroach (*Periplaneta americana*) and the brown-banded cockroach (*Supella longipalpa*). The German cockroach prefers moist kitchen and bathroom areas while brown-banded cockroaches are most often found in the drier areas. American cockroaches are generally found in very high moisture habitats (sewers, basements, mulch etc.).

IPM ACTIONS FOR COCKROACHES

An IPM approach to cockroach management is not a matter of using any single tactic. Rather it involves a number of elements which, when used in an integrated fashion will reduce the initial infestation, and eliminate the conditions which allowed cockroach populations to become established and to increase in the first place. The most severe infestations demand combined use of many strategies

Use the following strategies as you create your IPM Response Plan for cockroaches. Don't be afraid to consider strategies not listed here. The list is organized roughly from easiest/simplest strategies to most challenge/complex strategies to employ. Working with your IPM Coordinator – determine what actions you will take at each level of infestation.

The IPM Response Plan leaves the largest space for prevention. Remember IPM strategies work best *before* an infestation has grown to problematic proportions. Use the IPM Response Plan in section 1 of your binder or access an electronic copy saved on the disc.

FIRST ACTIONS

First Actions covers administrative actions or first responses to consider when combating roaches.

- § Inventory areas where roaches have been found (see paragraph "MONITORING/INSPECTION").
- § Call your pest management professional.
- § Call a meeting of all personnel who work in the area (i.e. kitchen staff, custodial staff, teachers) to discuss the problem and retrain as necessary.
- § Provide Food service and custodial staff with information on how to maintain cockroach-free kitchens, dining rooms, and waste disposal areas by applying the methods described below.
- § Teachers, students, and other staff also play a significant role in maintaining a high level of sanitation in other areas of the school, so they must be informed of their responsibilities in that regard as well.

KEEP PESTS OUT

Most cockroaches go where people go. They enter buildings on deliveries, inside children's coats or bags or through drains. Once inside, they easily establish themselves and reproduce quickly. Consider these strategies for keeping pests out:

- § Move dumpsters far from the back door
- § Keep dumpster lids closed.
- § Address any and all access points that were identified by your pest management professional
- § Seal openings to the basement
- § Remove pheromone trails (anywhere cockroaches run) by cleaning with a 1:1 solution of vinegar water or other cleaning solution.
- § Unload deliveries and store products on shelves without cardboard boxes
- § Keep floor drains wet (don't let the goose-neck dry out)
- § Send notice for all parents to wash winter coats
- § Send notice for all parents to clean out backpacks
- § Check potted plants to ensure they are not bringing roaches inside
- § Keep children's coats in one easily cleaned area (place monitor traps nearby)
- § Schedule a brief training on IPM for parents (call Safer Pest Control Project for details).

REMOVE PESTS' FOOD & WATER

The simple act of limiting food, water and harborage will dramatically reduce the number of cockroaches an environment can support. It will also make the toxic roach baits appear more desirable to the roaches.

But be aware, German cockroaches can survive for up to two weeks without food but they must have regular access to moisture or they will die within a few days. Pay particular attention to sources of water.

- § Sweep and mop daily – especially in places where food is handled
- § If children eat snacks in classrooms, HEPA vacuum and/or wet mop these floors daily. Clean to the corners: periodically move all appliances in the kitchen and clean behind
- § Periodically clean evaporation trays
- § Do not allow dirty dishes to sit in the sink – especially overnight.
- § Clean inside and underneath the microwave oven
- § Store food properly – in hard plastic containers
- § Clean up spills immediately
- § Clean garbage cans
- § Use garbage can liners with tight fitting lids
- § Take out garbage at end of each day
- § Limit areas where food is eaten
- § Get rid of all cardboard (roaches eat the glue)
- § Use enzyme cleaners or a stiff wire brush to clean drains
- § Periodically, give food preparation areas an all-inclusive cleaning, focusing on areas where grease accumulates: drains, vents, deep fat fryers, ovens, and stoves. Do a locker clean out
- § Do not allow students to store food in their locker
- § Create an intensive cleaning schedule
- § Inform teachers and staff that snacks in the desk must be stored properly
- § Clean vents and hoods to eliminate grease build-up Keep shipping boxes out of the food preparation area
- § Eliminate water sources by fixing leaks in a timely fashion
- § Speak with food distributor about cockroach problems – ask if they have problems at the warehouse
- § Locate a new food distributor.
- § Go to cold food (temporarily) to leave time for intensive cleaning
- § Make cleaning and sanitation part of everyone's job
- § Get rid of all classroom pets
- § Remove microwave from teacher's lounge
- § Move recycling containers outside or to a more appropriate location

REDUCE PESTS' SHELTER

Just like you and I roaches prefer private places to eat, sleep and reproduce. Cockroaches exhibit a behavior called 'thigmotropism' – whereby they prefer contact with solid surfaces on all sides of their body. This drives them to search out cracks and crevices that provide a tight squeeze. Reduce roach harborage by caulking and sealing cracks and crevices. Here are more strategies to employ:

- § Eliminate cracks and crevices using caulk. Vacuum and wash the area to eliminate egg cases, fecal material, and other debris before sealing.
- § Use silicon caulk or mildew-resistant caulk around sinks, toilets, and drains.
- § Get clutter problems under control *ESPECIALLY* in food service areas!
- § Banish cardboard (juvenile roaches live in the baffles).
- § Check potted plants to ensure roaches are living in them
- § Patch all holes in the walls
- § Repair holes in window screens
- § Weather-strip around doors and windows
- § Use caulk to seal cracks and crevices like loose baseboard molding; crevices behind cabinets and cupboards; behind sinks; etc.
- § Check behind posters and pictures to look for roach feces. Laminate posters so they can be washed with vinegar solution and remove pictures from infested areas if they are not required.
- § Use wire brush and enzyme cleaning solutions to clean in and around sump pumps.
- § Repair damaged walls
- § Repair loose baseboards and other molding
- § Schedule a school-wide 'clean out day' for everyone to clutter bust
- § Place emergency work orders for caulking nooks and crannies
- § Remove classroom pet
- § Remove posters from walls in infested areas
- § Remove stacks of papers and magazines or place them into clear plastic bins with tight fitting lids.
- § Identify likely harborage by looking for areas of dense cockroach droppings

MONITOR FOR PESTS

Cockroach management begins with a thorough visual site inspection and a continuous monitoring program. Inspection forms for lunchrooms and schools are found on our website at www.spcpweb.org (click on schools or childcares at the top). Cockroaches are rarely distributed everywhere throughout the building. Once they have located a suitable harborage, they frequently concentrate there, leaving periodically to forage for food and water. Use these strategies when monitoring for pests:

- § Thoroughly inspect the facility – this is the responsibility of the Pest Management Professional under an IPM Contract (see instructions below for guidance).
- § Focus on cockroach's preferred habitat: near and under sinks and stoves; in or near motors of refrigerators and other appliances; in or near electric clocks, switch plates, and conduits; next to computer equipment; near leaky plumbing fixtures; near steam pipes or hot water pipes with insulating jackets; near drains; in drawers and cupboards; and in areas where packaged goods and equipment are delivered and stored.
- § Place insect sticky traps in all areas of the facility and mark them on a map or keep a record on the 'monitor trap log'. Increase concentration of sticky traps in areas with cockroach activity. Sticky traps play a vital role in cockroach management by indicating the location and severity of a problem.
- § Many brands of sticky traps are available, but most are of a similar design -- a rectangular or triangular cardboard box with bands of sticky glue inside. Some models contain a dark strip of cockroach attractant as well.

- § The best sites for placing traps are near harborages and along cockroach travel routes. Initially, it is best to put out traps at all suspected harborages, water resources and travel routes. However, avoid placing traps in extremely dusty or moist areas because they will quickly lose their stickiness.
- § Keeping in mind the habitats preferred by cockroaches, place the traps in the following types of locations: near and under sinks and stoves; in or near motors of refrigerators and other appliances; in or near electric clocks, switch plates, and conduits; next to computer equipment; near leaky plumbing fixtures; near steam pipes or hot water pipes with insulating jackets; near drains; in drawers and cupboards; and in areas where packaged goods and equipment are delivered and stored.
- § Cockroaches like to travel along edges where vertical and horizontal surfaces intersect (i.e.: where the floor and wall come together). Hence, it is important that traps be placed flush against the vertical surface or the cockroaches may continue to travel behind the trap without ever entering it. Number and date each trap before deployment and mark trap locations on the map. After 24 to 48 hours, pick up the traps, then count and record the number of cockroaches in each trap. Record the date and the number of cockroaches on the monitoring form.
- § Use trap counts recorded on the map to pinpoint sites of infestation. Traps with high numbers of cockroaches indicate nearby harborages, and this is where management efforts should be concentrated. Large numbers of adult cockroaches in the traps can indicate a potential population explosion.

Have sticky traps inspected weekly or monthly (depending on your preference and the severity of the problem). Continue monitoring after treatments to determine whether or not control efforts have satisfactorily reduced the cockroach population or if roaches are again on the increase.

When inspecting for cockroaches, define the specific area that is to be inspected on a map. Inspect the entire area in a systematic and logical fashion from floor to ceiling to make sure no potential harborage areas are overlooked. Most inspections are conducted during daylight hours for the convenience of the inspector. However, since cockroaches tend to remain hidden during the day it is difficult to access the size and location of the population until after dark. Therefore, be sure to schedule at least one inspection after dark when the majority of the population is active. This will give more information about where the cockroaches are and the level of sanitation at a time when the building is supposed to be clean. Begin the inspection with the lights off if possible. A flashlight covered with a yellow filter will prevent cockroaches from being disturbed while looking for harborages and sources of food and water. Then turn on the lights and examine areas where cockroaches were observed. Note this information on your map.

TREAT EXISTING PROBLEMS

Treating a problem always comes last. It is important to take care of prevention (keeping pests out; removing food & water; reducing shelter) before eliminating a problem. Otherwise you will be attempting to eradicate a pest that keeps replenishing itself. Consider these strategies:

NON CHEMICAL CONTROL OPTIONS:

Use a strong vacuum with a HEPA filter to pick up live cockroaches as well as their egg cases and droppings. Vacuuming is a very good strategy if the roach population is large. Once a large portion of the population has been eliminated it is much easier to eliminate the remaining cockroaches with other treatment measures.

CHEMICAL CONTROLS OPTIONS

If non-chemical methods alone prove insufficient to solve the problem, integrating a chemical control option, consistent with the requirements of the Illinois Structural Pest Control Act into the management program may be warranted. The most recent advances in chemical control for cockroaches have been in bait formulations, and insect growth regulators. Other currently used products include desiccating dusts.

Pesticides should be used only when other strategies have failed or when health of students and staff are at risk. All pesticides require notification of staff, students, parents and guardians at least two days prior to application. Gel baits and containerized baits are exempt from notification. Labels and Material Safety Data Sheets (MSDS) for the pesticide products authorized for use in the IPM program should be maintained on file (in the IPM Binder). Do not apply these materials when buildings are occupied, and never apply them where they might wash into the sewer, storm drains or any body of water.

Cockroach baits consist of a food source mixed with a toxicant. Some bait also contains attractants or feeding stimulants that are supposed to make the bait more attractive to cockroaches than other available food sources. Indoor bait formulations are applied as bait stations, gels, or pastes. The bait station is one of the more popular application methods for educational facilities because the stations are easy to put out, they are safe around children, and animals, and can be removed when the pest is controlled. Gel formulations are packaged for injection into cracks and crevices that are not easily accessible.

Small amounts of bait placed in numerous locations work better than large amounts placed in central areas. Place bait near harborages and between harborages and water sources, using maps and information collected from monitoring traps.

Do not place gel or paste baits in areas where they may get covered over with grease, flour, or dust, use bait stations instead. Avoid harsh environmental conditions when baiting. In excessively warm areas baits can melt and run. In cold locations the cockroaches do not move far and may miss the bait. In very wet locations the baits may grow mold and become unattractive to cockroaches. Check baits frequently to make sure that they have not been completely consumed or inadvertently removed by cleaning.

Inorganic dusts, such as silica gel and boric acid, have been used successfully for indoor cockroach control. These dusts must be handled with care and placed in areas that are inaccessible to children and ventilation (like behind wall voids). They can initiate an asthma attack in children with asthma and will require prior notification to parents, guardians and staff prior before use.

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