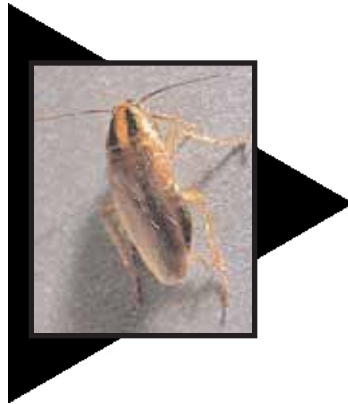




[Location] PEST DIVISION

[address]



"SO, WHAT'S BUGGING YOU?"

# Truly on ... the German Cockroach



Commercial guide to cockroach prevention and elimination



Courtesy of

[Location] PEST DIVISION

1-000-000-0000

# Facts

As with any insect, the German cockroach has three basic survival needs:

1. **HARBORAGE** - a safe place, generally a crack or crevice
2. **FOOD** - organic material
3. **MOISTURE** - sources include food, water and bodily fluids

The cockroach is an omnivore, eating both meat and plant matter. They are dependent on man for survival and, therefore, are commonly found in commercial settings and anywhere that food is prevalent. Such environments include:

- Nursing Facilities
- Restaurants
- Supermarkets
- Warehouses
- Schools
- Prisons
- Cruise Ships
- Naval Vessels
- Food Processing Plants



*Inspecting a salad bar for pest activity.*

The insect is an indiscriminate diner, eating anything and everything. It prefers an environment that is abundant in food and water and is especially fond of sweets and meat.

Other than the kitchen, ideal commercial locations include the supermarket prep area, a restaurant dining room, the deli counter, the butcher's prep area, a salad bar, a portable dining cart, refuse disposal areas, etc.

While human food is preferred, the cockroach is not adverse to consuming paper (including paper currency), hair, canvas (artwork), fabric, the paste in book bindings, computer tapes, sewage, toothpaste, soap and even the

parchment on which old documents are often printed. This insect has had a significant impact on the high tech world by damaging computer components storing data.

In a significant infestation, the German cockroach is known to consume body hair (eyebrows and eyelashes) from sleeping inhabitants, especially infants, incapacitated individuals and the elderly.



# 5 Critical Questions to ask before selecting a Pest Control Company



## 1. HOW LONG HAS THE COMPANY BEEN IN BUSINESS?

You need a company with a proven track record . . . one that you can depend on for the long-term. Truly Nolen has been in business for more than sixty years. Now, that's staying power!

## 2. IS THE PEST CONTROL COMPANY PROACTIVE?

Your pest control company should have a proactive plan to keep pests out of your home or business - before they get in and adversely affect your environment. Truly's Three Zone Pest Management Program gives insects a one, two, three punch by building barriers to keep pests out of your environment.

## 3. WILL A TRAINED, CERTIFIED TECHNICIAN INSPECT AND TREAT MY HOME OR BUSINESS?

The technician inspecting and treating your home or business should be professionally trained and continually educated. Truly Nolen employs trainers who make sure that our state-certified technicians are up to speed on the latest technology and most advanced techniques available. Our commitment is to provide you with the best possible pest management program with the least impact on your environment.

## 4. THERE HAVE BEEN MANY TECHNOLOGICAL ADVANCES IN THE INDUSTRY. DOES YOUR COMPANY TAKE ADVANTAGE OF THESE IMPROVEMENTS?

Your pest control company should use state-of-the-art methods that are environmentally sensitive. Truly Nolen technicians combine the strategic application of baits with natural, long-lasting materials to treat the interior of your structure.

## 5. WHAT IS THE COST OF THE PEST CONTROL SERVICE?

There are many variables in the price that pest management companies charge. What you are purchasing is protection - for your home or business, your family and your customers. While Truly Nolen is not the least expensive, we take great pride in delivering the most value for your money. Keep in mind that the difference between the most and least expensive companies is often just a dollar a day.

Ask your Truly Nolen inspector for a . . .

## Complimentary Pest Inspection

You'll receive a written report describing the pest management tasks that need to be addressed in your home or business. You'll find that this report is a valuable tool, regardless of your final decision.



# Solution

**Gel bait** Bait is generally applied in BB pellet-sized amounts. It is optimally placed in cracks in or near harborage. Harborage include kitchen cabinets, kitchen appliances, seams in table tops, countertops and in the bathroom area.

## Sample Baiting in a Commercial Kitchen



Whether a sink next to the prep area or the disposal/washing area, there is a tremendous amount of organic waste present that can lead to insect infestation issues. For example, in a commercial kitchen, the smart technician will thoroughly inspect and treat the following:

- seams, cracks and crevices in stainless steel work surfaces, including wash tables, prep tables, dishwasher, racks, backsplashes, drawers and countertops
- plumbing access points and disposal seams
- cove base and door frames
- trash receptacles, including wheel assemblies
- behind wall-mounted devices such as soap dispensers, paper towel dispensers, etc.
- behind wall mounted light fixtures
- behind outlets/switches (use rubber tip on duster)



# Facts

During the day, German cockroaches cluster together hiding in a multitude of places. For instance, they hide in cracks and crevices located -

- behind baseboards, cove base and molding
- in wall voids, using plumbing pipes as a protected superhighway throughout the structure
- between wall mounted commercial equipment, such as a cooktop exhaust hood, and the wall
- in food storage areas
- in stoves, with ready access to greasy cooktops
- in commercial refrigerators, especially in seals and around the compressor
- in and around dishwashers
- in and around plant material
- any secluded place with nearby access to moisture and organic material



*German cockroaches take refuge in lip of formica countertop, out of sight of human inhabitants.*

The roach seeks out harborage where the top of its body is also in contact with a surface, where it feels safest from predators. This is a clue for the inspector or technician - check cracks and crevices. It is the most likely place to find the insect.

The roach population spends 75% of its time tucked away in harborage. A nymph needs a crack no smaller than 1/32" in which to seek harborage, while an adult needs a crack no less than 3/16". If one sees cockroaches during the day, it is fair to assume that the infestation is large.

## Myths

- Cockroaches only live in dirty environments. **WRONG!** *A roach population can find food sources in virtually any commercial environment.*
- "I only saw one cockroach, and I killed it. So, I'm pretty sure that there aren't any more." **WRONG!** *Cockroaches are prolific breeders. Where there's one roach, there are many more.*
- Cockroaches are only around during the summer. **WRONG!** *The German cockroach lives with man, so it is present year around.*
- Cockroaches only come out at night. **WRONG!** *While cockroaches are most active at night, one might see activity during the day, especially with a large infestation.*
- Cockroaches don't fly. **WRONG!** *Males have wings!*
- Cockroaches never migrate from a neighboring building. **WRONG!** *Pest pressure can force a large roach population to find better accommodations.*

# Hazards

## Food Poisoning

The insect must ingest bacteria in order to digest food. The cockroach accumulates bacteria and other pathogenic agents through its foraging activity. As a result, this insect is significantly implicated in the transmission of Salmonella, a bacterium that causes food poisoning, dysentery and/or diarrhea. Bacteria, which can remain viable in the insect's intestinal tract for up to nine days, are transmitted to mammals via indirect contamination. Yes, by simply coming in contact with food or a utensil used in food preparation, the insect can indirectly transmit the bacteria to humans that consume or use those infected items. If one fecal pellet is dropped on a utensil or dish, then consumed by a human, that individual is at a high risk for developing dysentery.



## Allergies



Although not commonly reported, humans can die as a result of an allergic reaction to cockroaches in their environment. The remnants of cockroach exoskeletons and fecal matter decompose into dust-like particles that can easily become airborne. These particles act as allergens. Whether inhaled or ingested, allergens associated with cockroaches trigger respiratory events and other types of allergic reactions. Most asthmatics are allergic to cockroaches.

## Odors

Not only does the German cockroach contaminate food with its excrement, it emits a foul odor and leaves fecal pellets wherever it travels. The odor is the result of fluids secreted by the scent glands in the insect's abdomen, as well as fluid it regurgitates while eating. The roach uses this fluid to mark its runways and locate the fecal focal points by scent. In the human environment, these body fluids and the insect's excrement damage and contaminate everything the insect touches. Humans can experience dizziness, nausea and a burning sensation as a result of this insect's foul smell.



## Financial Impact



Aside from the loss of product to the damaging effects of an infestation, the smart business manager knows that his customer base is impacted by the infestation. Whether through increased retail prices to cover for loss due to infestation, or by the emotional impact of seeing the infestation while in the business, the customer is negatively affected by this insect.

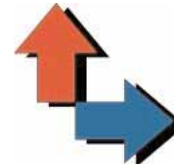
**FACT:** Of those customers who see a roach in a business, 20% tell the manager and 80% tell their friends. Enough said!

# Solution

## Step #3 Control

A thorough treatment is essential! Due to the German cockroach's rapid reproductive rate, frequent services are necessary. Control of the German cockroach requires a two-step process.

A **boron-based dust** is applied lightly in cracks and crevices for long-term cockroach control. Boron dust works well as it combines with the environmental contaminants that are the natural food of the roach, creating a toxic bait.



A **gel bait** is applied, which serves as a food source for the roach. It is optimally placed in cracks in or near harborages. Two different bait flavors are used so that the cockroach does not alarm to a single scent. Once ingested, it becomes a rapid acting stomach poison. Strategically placed, it yields a faster kill.

Dust is the foundation and is applied first, followed by baiting to augment the dust.

**Dust** Boron-based dust works well in dirty environments as it combines with the environmental contaminants that are the natural food of the roach, thereby creating a toxic bait. How does dust work?

- This boron-based product is ingested by the German cockroach, subsequently killing the bacteria and other pathogens living in the insect's gut.
- The cockroach feels hungrier and, therefore, is more likely to eat the baits.
- This cockroach defecates, but the fecal matter does not contain the essential bacteria required by the population to maintain digestion.
- Other cockroaches will consume the fecal matter, hoping to regain the needed bacteria for digestion. However, the fecal matter is void of the bacteria. Without the bacteria, they starve and die.



# Solution

## The RED Zone

Servicing high profile public access areas without any noticeable sign of treatment.

Inspection and treatment includes:

- waiting areas (interior and exterior)
- dining room/bar areas
- patios
- restrooms
- cash register area
- all hallways with public access
- public telephone areas
- elevators & stairways



## The YELLOW Zone

Treating support areas, where insects generally enter the structure and breed.

Inspection and treatment includes:

- kitchens & food storage facilities
- employee lounges, break rooms
- utility service areas & janitorial closets
- employee restrooms & locker rooms
- loading docks/receiving & shipping areas
- business offices
- laundry/linens storage areas



Good treatment protocols in the Yellow Zone are the best defense for the Red Zone.

## The GREEN Zone

Protecting the business's image, beginning with first impressions at the front door.

Inspection and treatment includes:

- walkways
- parking lot
- landscaped islands
- publication dispensers
- benches
- trashcans
- driveway/customer drop points
- landscaped areas adjacent to walkways
- building perimeter and vertical surfaces
- roof, including eaves



# Biology



The female German roach mates once in a lifetime and can subsequently produce multiple egg capsules without further contact with a male. It breeds year around, but is most prolific when living in a humid environment with an average temperature of 70° to 80°. A female may produce four to five oothecae (egg capsules) during its lifetime, each containing 30 to 48 eggs.

The German cockroach has three life stages: egg, nymph and adult. The nymph is wingless, one-eighth to one-half inch long, initially translucent white in color and lacks the necessary bacteria in its intestines to digest food. On an average, the insect transitions from egg to adult in 103 days, with variances in this timeframe based on environmental conditions.



*Above- egg capsules.*

Within its first three months, the nymph must go through an average of six molts (exoskeleton and gut lining is lost and replaced), with each interim phase known as an instar. With each molting, the nymph's new soft exterior is a translucent white color. Immediately after molting, the nymph tends to remain concealed in a safe harborage and does not eat. This behavior lasts until the exoskeleton again hardens, taking on a light to dark brown color with dark colored parallel stripes running down its back. It now must seek out fecal material containing microflora (bacteria, fungi, protozoa, etc.) to replenish its gut lining so that the insect can again digest food. It obtains this bacteria by consuming the fecal matter of other roaches. Without the bacteria, the nymph will starve.

*Below- nymphs hatching from egg capsule.*



The fecal focal point is a central toileting area for the cockroach infestation. Not only do they defecate at this location, they return to consume fecal matter in order to regenerate essential bacteria in their gut.



*1st Instar*



*3rd Instar*



*6th Instar*

Female roaches live about 200 days, while the male has a somewhat shorter life span. Both male and female have wings but they do not fly. An established cockroach population generally consists of 25% adults and 75% nymphs.

Cockroaches or their egg capsules can travel to a new environment in soft drink cartons, sacks of potatoes or onions, used furniture, beer cases, packing crates, etc. They can even make a long trek by hitching a ride on a semi-truck or a ship. While rare, this insect has even been known to migrate in mass to a different location when the population exceeds the available food supply at the current site of infestation.

# Solution

## Step #1 Exclusionary Measures

Exclusion implies that the technician seals up cracks and crevices that provide insect harborage and easy access into the structure.

Exclusion focuses on insect harborage areas, such as cracks and crevices near food and moisture sources.



*Around incoming gas and water lines.*



*Around utility conduit.*



*In cabinetry cracks, both inside and outside of units.*

The technician will also inspect and exclude as needed any harborage near areas with obvious water damage, near cooktops, backsplashes for countertops, where cabinetry meets vertical surfaces, where dining booths abuts the wall, behind augmented wall coverings, under window sills, etc.



Through the use of clear silicone caulk and stainless steel wood, exclusion is very effective at reducing or eliminating key insect harborage areas. Pictured above, a technician seals an opening around a spigot on the building's exterior.



Exclusion includes both interior and exterior surfaces. Damaged areas and construction defects provide interior and exterior gaps such as those pictured left. This is an "open door" to insects and rodents alike.



The pest uses the seclusion of the wall voids as a superhighway throughout the building. It searches for an exit point that gives it access to food and moisture sources in the building. With its basic needs satisfied, it sets up housekeeping. The infestation is underway.



# Solution

## Step #2 Sanitation

Sanitation plays a major role in cockroach control. While this can be a difficult subject to broach, the pest management professional is obligated to identify such issues, document each in his service report, and discuss with the owner or manager how he/she can resolve such issues. Resolution of sanitation concerns is primarily the responsibility of on-site staff.



Some common suggestions are as follows:

- Remove trash from site no less than daily. Keep trash in a container with tight fitting lid.



- Clean up all spilled food and liquids.

- Do not leave unwashed dishes anywhere on the premises.



- Clean sinks and dishwashing areas, removing any organic debris.

- Keep food products in sealed bags or containers. Dispose of expired boxed produce.



- Eliminate water sources by promptly addressing plumbing leaks.

- Remove excess paper and/or cardboard debris from the environment.



- Routinely clean the environment to remove organic debris and grease buildup.

- Maintain the facility to reduce harborage areas.

