

Roach Control and Prevention Without Toxic Pesticides

Roaches present a significant challenge at facilities. Roaches are disease vectors; their ability to transport germs and act as asthma triggers makes for a zero tolerance policy for roaches at any facility. Unfortunately, since these insects eat almost anything, and they have a knack for living, breeding, and traveling in hard to reach places, solving a roach infestation is a difficult task. The most effective way to solve a potential roach pressure is through prevention.

Human health:

Cockroaches have significant negative consequences for human health. They can transport both proteins (called allergens) and microbes that include potentially dangerous pathogens. The allergens can cause allergic reactions or trigger asthma symptoms, while the pathogens can include E. Coli, Salmonella, and other bacteria or parasites dangerous to humans.

Identification:

German cockroaches are tan, brown, or almost black, and have two dark – almost black – parallel bands running the length of the pronotum. They grow to about half an inch and do not fly. This roach prefers squeezing into small cracks where its back and undersides make contact with other surfaces. They are often found backed into cracks with their antennae and heads sticking out, picking up chemical signals from the air, upon which their behavior is more dependent than vision or sound. They become more active 20 minutes to 2 hours before dark, and increase their activity to a peak ending before daybreak. Only when populations have significantly increased to a certain threshold will they be active

during daylight. The first step for preventing roaches is to understand the habitat of the roach, particularly where they enter, what they eat, and where they can survive.



Preventing cockroaches in healthcare facilities:

Sanitation:

- Remove sources of water
- Remove food sources
- Dispose of trash
- Place trash in sealed containers
- Store food in air-tight, sealed containers
- Remove clutter, such as piles of paper where roaches can hide
- Do not store food in cardboard boxes
- Remove items from cardboard packaging, and then remove the cardboard from the facility
- Keep drains clean
- Keep kitchen appliances free of grease

Structural:

- Keep drain caps full or capped
- Caulk all cracks and crevices
- Caulk around items that are fixed to the wall (ie. a bulletin board)



Roach Control and Prevention



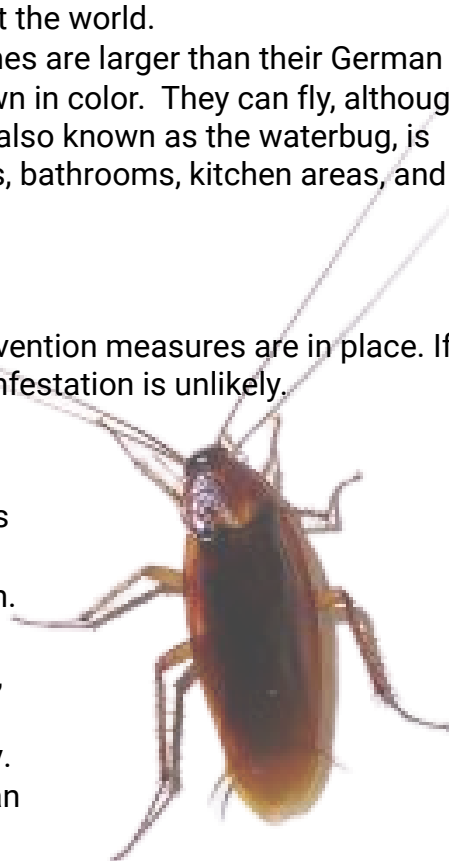
Most German cockroaches enter a facility when an egg case (each egg case can contain up to 50 eggs) is introduced in shipped materials, beverage cases, or produce packaging. They are often hidden deep in the folds of corrugated cardboard. When roach egg-case-infested cardboard enters a facility or dietary area and is not removed, the eggs have time to mature and hatch. If they hatch into an environment with moist floors, dirty trash receptacles, access to food waste, as well as cracks and crevices for shelter, an infestation is likely. These roaches are the most ubiquitous pest and are found throughout the world.

American Cockroaches are larger than their German cousins. They can grow to about 1.6 inches and are reddish brown in color. They can fly, although they rarely do. The most common entry point for these roaches, also known as the waterbug, is sewer connections; thus, they are often discovered in basements, bathrooms, kitchen areas, and unused drains.

Control

If a roach is discovered, the first step is to make sure that all prevention measures are in place. If the roach is denied access to food, water, and shelter, a further infestation is unlikely. The next step is to eliminate the current roach infestation, using least-toxic products.

- Boric acid is the most effective direct control method, and it is available in a variety of products and formulations. It can be applied as a gel or liquid bait, or in its traditional granular form. It should be applied to cracks and crevices where roaches hide: inside and behind cabinets and appliances, wall cavities, under sinks, and near pipe penetrations. Boric acid, does not offgas, making it a safe product to use in a health care facility.
- Dessicating dust, such as diatomaceous earth or silica gel, can be blown into voids through small holes drilled into the walls. Be sure to choose a dust that is not mixed with pyrethrins, as this chemical has been known to cause allergies, asthma, and respiratory irritation. Dusts with pyrethrins are typically formulated with piperonyl butoxide (PBO), a synergist that reduces the ability of both insects and humans to detoxify pesticides. Inhaling PBO can cause labored breathing and an accumulation of fluids in the lungs, and is also linked to cancer. Dust sealed into wall voids or cracks can be effective for many years if they are kept dry.



Pesticide Profile: Indoxacarb

Indoxacarb is a very common chemical used in many products designed for killing insects, such as roaches and ants. Some pest management technicians consider it a least-toxic pesticide. However, due to its toxicity and volatility, indoxacarb is not a least-toxic and should not be used in an IPM program.

What is Indoxacarb?

Indoxacarb is a broad spectrum insecticide used to kill many insects. It is found in several formulations, including tablets, granules, water dispersible, and gel. Indoxacarb has been promoted by the industry as “reduced-risk,” but serious health risks have been associated with exposure to this chemical. It works by interfering with the flow of sodium ions into nerve cells. This flow of sodium ions is essential to nervous system function. This disruption can cause tremors, cessation of feeding, paralysis, and death in insects. been promoted by the industry as “reduced-risk,” but serious health risks have been associated with exposure to this chemical. It works by interfering with the flow of sodium ions into nerve cells. This flow of sodium ions is essential to nervous system function. This disruption can cause tremors, cessation of feeding, paralysis, and death in insects.

Toxicity

Studies suggest that indoxacarb is associated with both acute and chronic toxicity. EPA has classified indoxacarb as a moderate dermal irritant (acute toxic category III), due to its ability to cause skin sensitization after contact. If ingested orally, it is classified as toxicity category II and is extensively metabolized by the liver. There is evidence of lung damage in acute inhalation studies, which indicate the development of acute lung injury and high permeability pulmonary edema. This is attributed to an oxidant generated during indoxacarb metabolism.

Indoxacarb also shows some signs of neurotoxicity after acute exposure in rats, causing a decrease in motor activity and decreased forelimb grip strength. Chronic exposure can cause a reduction in the number of red blood cells and a depletion of blood-forming elements in the bone marrow and lymphoid organs. Chronic exposure can also cause neurotoxic symptoms similar to acute symptoms: weakness, abnormal mobility, and inability to stand.



Volatility and Alternatives to Indoxacarb

Indoxacarb has a low vapor pressure, which contributes to the occasional misuse of this chemical as a least-toxic pesticide. However, despite its low volatility, it is volatile and will evaporate poisonous vapors into the ambient air. In sealed buildings, such as health care facilities, pesticide residues present a greater risk to the air supply.

With an effective IPM plan in place, non-toxic strategies are implemented first to prevent and combat pests, such as ants and roaches, instead of using pesticide products containing indoxacarb. These strategies include caulking and sealing small openings, cracks, and holes, removing habitat, such as cardboard, storing food in sealed containers, repairing leaks and removing standing water, and maintaining dietary areas free of grease and other potential food sources for pests. As a last resort, a least-toxic pesticide can be used. Products like boric acid, diatomaceous earth, and silica gels are completely non-volatile and are thus considered least-toxic in an IPM program.

