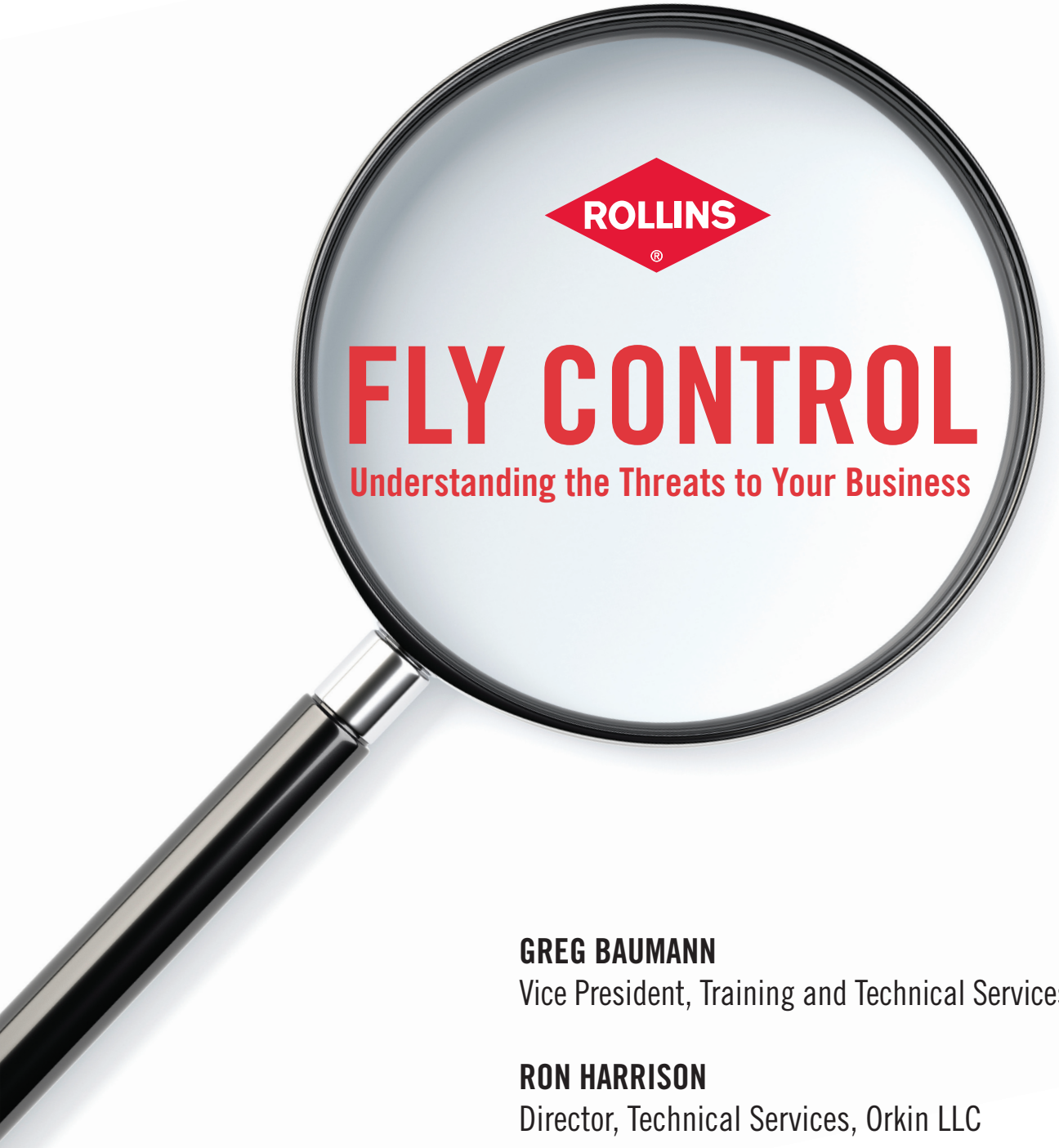

FLY CONTROL

Understanding the Threats to Your Business

GREG BAUMANN
Vice President, Training and Technical Services, Rollins Inc.

RON HARRISON
Director, Technical Services, Orkin LLC

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Musca domestica, or the house fly (shown), is the most common domestic fly and one of the world's most widely distributed insects. It is considered to be a pest that can transmit serious human diseases.

Capable of carrying billions of germs, flies are more than just a nuisance—they're a threat to businesses.

Regardless of technological advances, flies are still a major menace. They are among the filthiest of all pests, carrying billions of germs on the outside of their bodies.

There are over 200 fly species in North America that are considered "filth" flies and utilize a human's environment to thrive. A persistent problem in all types of commercial business settings, flies can irritate customers, transmit disease and even contaminate products. They're not just a nuisance, they're a threat to businesses.

But, armed with education and employee training, businesses can implement best practices for fly prevention and remediation.

A TOP PEST CONCERN

So, why are flies such a concern for businesses?

- **Flies breed quickly.** The female housefly (*Musca domestica*) can produce up to 1,000 eggs in her lifetime. These larvae develop into adults in about 7-10 days. And if the proper conditions exist, a population explosion can occur.[1] In many areas of the country, house flies are the #1 fly problem.
- **They can contaminate food.** Certain fly species move from rotting, disease-laden garbage and fecal material to exposed food and surfaces.
- **Flies spread disease.** Flies can transmit pathogenic microorganisms (internally or via the numerous hairs on their bodies) that cause *E. coli*, *Salmonella* and shingles. The *American Journal of Public Health*[2] notes that "*Salmonella enteritidis* may be transmitted with ease and rapidity through several populations of flies." And, in a 2010 study with the University of Florida's Institute of Food and Agricultural Sciences, researchers from UF and Orkin documented five more bacteria species carried by house flies that were not previously linked to the pests. The diseases can cause food poisoning or even respiratory infections in humans.[3]
- **They can undermine a business's image.** Unlike many other insect species, flies have only two wings, therefore they land frequently, providing them the opportunity to leave behind droppings, regurgitated food and potentially disease-causing pathogens every time they land.
- **Flies cost money.** They can be responsible for loss of customers as well as regulatory fines from government agencies. Google "flies and health inspection" and you'll see restaurant blogs reporting establishments that racked up violations for flies, as well as restaurants that were actually forced to close.

Flies are stubborn pests that can affect any business, so when it comes to your company's reputation and bottom line, controlling flies through prevention should be a crucial part of your pest management strategy.

FLIES 101

To understand how to thwart flies, it's important that business owners and staff educate themselves about different fly species, attractants that entice certain flies to specific settings, and ways to eliminate or reduce them. Education is critical to effective prevention and treatment.

[1]Bonnefoy, X., Kampen, H., Sweeney, K. (2008). Public Health Significance of Urban Pests.

[2]Ostrolenk, M. and Welch, H. (1942). The House Fly as a Vector of Food Poisoning Organisms in Food Producing Establishments. *American Journal of Public Health*, 32: 487-494.

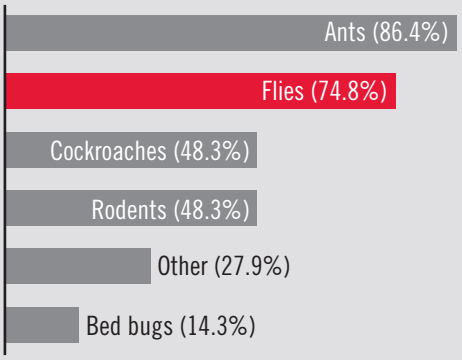
[3]Anderson, M. (2010). UF Discovers House Flies Carrying Five New Illness-Causing Bacteria. *University of Florida News.* Retrieved from http://news.ufl.edu/2010/08/26/flies.

THE BUZZ ABOUT FLIES

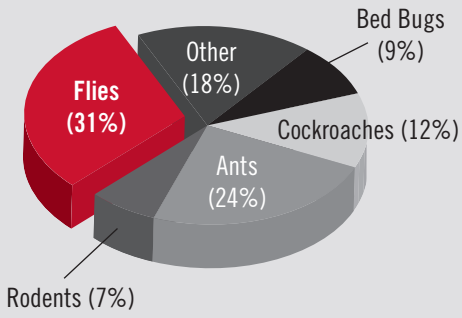
In surveys conducted by Orkin with the Building Owners and Managers Association (BOMA) and the Association for the Healthcare Environment (AHE), respondents reported flies as a top pest concern.

On the 2010 BOMA member survey, **1 in 4 respondents rated flies one of their top three pest concerns**, and almost half listed flies in the top four.

On the 2011 AHE member survey, **75 percent of respondents listed flies as one of the three most commonly encountered pests**:



Flies were ranked the No. 1 most common pest by a third of AHE survey respondents. **A majority (31 percent) also reported that flies are the most difficult pest to manage:**



COMMON FLIES FOUND IN COMMERCIAL ESTABLISHMENTS

NAME: *Musca domestica*, house fly
INHABITS: Food handling and non-food handling establishments

NAME: *Family Calliphoridae*, blow fly
INHABITS: Food handling establishments

NAME: *Drosophila spp.*, fruit fly
INHABITS: Food handling and non-food handling establishments

NAME: *Family Psychodidae*, drain fly
INHABITS: Food handling and non-food handling establishments

NAME: *Family Phoridae*, phorid fly
INHABITS: Food handling establishments

NAME: *Lycoriella spp.*, fungus gnat
INHABITS: Non-food handling establishments

In a business setting, we can boil it down to two types of environments: (1) food handling establishments and (2) non-food handling establishments.

FOOD HANDLING ESTABLISHMENTS

If you run a food handling business, whether it is a restaurant, grocery store or food manufacturing/packaging facility, flies are a likely health risk and nuisance. They seek the food, water and shelter that these facilities often provide. Flies are often attracted to buildings because of food odors, temperature gradients in the air and exterior lighting. Once inside, they can contaminate food, cause health inspection violations and irritate or disgust your customers – leading to lost revenue and damaging your business's reputation.

Flies can also carry billions of harmful microorganisms on their bodies, making them a potent disease vector. They are separated into several categories – filth flies, small flies, overwintering flies, biting flies, gnats and midges. The groups that most impact food handling establishments are filth flies, which can transmit disease. The other flies are considered nuisance flies, which usually do not transmit disease.

Many flies have become known as filth flies due to their association with potentially contaminated surfaces, such as food waste, feces, animal manure and the carcasses of dead animals.[1]

Because controlling flies is typically based on the species of concern, knowing which type of fly you're dealing with is half the battle. Different fly species also have different preferences for food and breeding sites. Identifying the fly species helps determine the location of its food source and customize the treatment plan. The following types of flies are the most commonly found in food handling environments:

House Flies – Depending on the area of the country, the most commonly encountered fly is the house fly, which can be identified by four length-wise stripes on the thorax. These pests can spread microorganisms such as bacteria, fungi and viruses to the surfaces on which they land. They

also can regurgitate during the feeding process, which enables them to transmit disease organisms to their landing surface.

Did You Know? House flies are attracted by ammonia released by different media and eat a variety of materials. Larvae are attracted to excrement while adult flies seek out human foods, trying to stay close to their feeding and breeding sites. They can travel up to 10 miles in just a few days.

Blow Flies – These flies' larvae develop inside of materials including rodents caught in traps or in walls. They are also called bottle flies due to their shiny, metallic-looking abdomen. They will readily feed on just about anything that we call "filthy," including animal waste, and they can detect a food source over a mile away.

Did You Know? Blow flies are often used in forensic entomology to estimate how long a dead body has been there by determining how developed the flies' maggots are. These flies are also attracted to methane gas.

Vinegar or Fruit Flies – Averaging 1/8-inch long, these small flies prefer to lay their eggs near fruits and vegetables, in addition to other decaying organic material. Fruit flies abound near fermented materials in trash cans and floor drains. Several species of fruit flies can be a problem: the black-eyed fruit fly (*Drosophila replete*) can often be a problem year-round.

Did You Know? *Drosophila melanogaster* has been used to study genetics for many years due to its fast reproductive rate.

Drain Flies – Sometimes called moth flies because of their appearance, drain flies are covered with long hairs and breed in and feed on decaying organic material. They are also known as filter and sewage flies, since they commonly breed in raw sewage under slabs where undetected broken pipes may be located. Like mosquitoes, drain flies need standing water to breed.

Did You Know? Drain flies are very weak flyers, so they prefer to crawl along damp surfaces such as drains and clogged roof gutters.

Phorid Flies – Easily recognizable due to their humped backs, phorid flies breed in decaying organic matter and are most often found in hospitals and restaurants. These 1/4-inch long flies thrive off the moisture found in the bottom of trash receptacles, under kitchen equipment, in drains that are backed up and contaminated with gook, in dirty mop heads and in over-watered potted plants.

Did You Know? Phorid flies can easily be distinguished from fruit flies because when they land, they run around (unlike fruit flies that land and usually stay in one place).

> "Most people simply wave a fly away and go back to eating, but a cockroach crawling across the table elicits a very different reaction. However, our research shows the house fly carries potentially twice as many pathogens as a cockroach."

Frank Meek, BCE
Technical Director, Orkin

Prevent a food contamination problem by using a combination of fly control methods to achieve maximum efficacy.

An ongoing fly control program that uses IPM practices such as exclusion and mechanical control can help reduce the use of chemical remediation.

Treatment Options

Once you identify the type of flies targeting your facility, work with your pest management provider to implement an ongoing fly control program. Since pesticides cannot completely control or solve a fly problem, we recommend inspection, sanitation, exclusion and trapping as effective Integrated Pest Management (IPM) practices in a food handling establishment. Let's explore how to keep flies at bay:

Inspection

First inspect the outside of the building for breeding and feeding sites. Carefully inspect for flies' larvae on all food and related materials as they are off-loaded from trucks. Generally, fly eggs are too small to notice, so any adult fly activity should be noted if spotted on incoming materials. Remember, most flies need moisture to reproduce, so their presence is an indication of wet and decaying material.

Be sure to rotate produce stock frequently to ensure freshness and eliminate moisture, which maggots need to thrive. Regularly inspect potential breeding sites and assess areas for possible attractants, such as garbage collection areas or floor drains where organic matter can accumulate. Remove wet garbage as often as possible and clean refuse areas frequently. If drain lines have leaks in them, small flies such as phorid flies and fruit flies may be breeding under the building slab. Using drain scopes to check for pipe cracks and repairing these pipes may eliminate the problem. In severe situations, the floor may need to be removed and the below slab soil removed and replaced.

Exclusion

Using exclusion methods can help prevent flies from getting inside. Caulk any cracks or crevices around the exterior of your building. Seal all doors and windows with weather stripping and install correctly fitting door sweeps to help keep flies out. If possible, add a second set of sliding doors at outside entrances, and make sure all doors and windows close tightly. Employ positive airflow (air that flows out of, not into, a building) or air curtains (using high-speed fans to create a "wall" of air that flying insects have difficulty crossing) at entrances and exits. Train employees to keep doors closed. Monitor doors after hours as well as doors that are propped open at night, which can invite flies and other flying insects. Lights around a door at night can also attract flying insects.

Sanitation

Most flies thrive in warm, moist conditions and seek out sites to reproduce. A complete sanitation program can help keep flies to a minimum. Odor is the first attractant for many fly species. Proper sanitation not only eliminates food and water sources for flies, but can also remove odor-causing organisms like bacteria and other undesirable compounds.

Place exterior dumpsters as far away from the building as possible, and work with your refuse management company to routinely clean or rotate the dumpster. Keep dumpster lids closed. Inside, make sure drains are checked and cleaned

periodically with a biological drain cleaner. Reducing odor can also reduce fly attractants: consider implementing an odor reduction program that uses enzymes to break down, not just mask, fly-attracting odors.

Mechanical Control

Flies are attracted to certain kinds of light. Use wall-mounted Insect Light Traps (ILTs) to control house flies. Wall-mounted units can also be used for night-time flying insects in areas where ceilings are no more than 8 to 10 feet. Position units near entrances with the light directed so it is not visible from the outside entrance.

Once a fly comes inside, the fly light should be the first light it sees. Most fly lights require electricity, so you may have to work with an electrician to install an outlet if needed. Lamps are most effective the first 30 days, so change them monthly until a fly problem is under control. It's important to note that ILTs only monitor the efficacy of the overall fly control program. By themselves, they are not a complete control option, but they are invaluable as part of a comprehensive IPM program.

Fly traps can be used in cafeterias, shipping and receiving areas, refuse collection points, food storage areas, or other areas where ILTs are not appropriate. Flies will fly into the traps but won't be able to fly out. One consideration of fly traps is that it's important to determine the proper trap for the species of concern and the appropriate placement. For example, house flies can be found close to the floor whereas cluster flies prefer to fly higher. Fly lights come in decorative styles known as sconces that can be used in dining areas if needed.

NON-FOOD HANDLING ESTABLISHMENTS

Businesses that do not prepare, sell or package food products, such as office buildings and retail establishments, may present a very different set of circumstances that attract flies. Typically, these types of buildings have many entrances, which means employees and customers come in and out regularly, giving flies easy access. There also may be unique areas where employees keep personal belongings, meals and snacks locked in desks or concealed in storage lockers. Lured by the odors, flies can find their way into these places and cause an infestation before anyone knows it. A banana left in a personal locker or potatoes left under the sink for several days may become a source of fruit or phorid flies.

Similar to food handling facilities, house flies, fruit flies and drain flies are also common in non-food handling establishments. Additionally, one fly species that is more commonly spotted in office or retail environments is the gnat. Most small flies are often grouped together and referred to as "gnats." Some gnats, such as the phorid fly, may indicate a sewer break; other gnats are just pesky but can be a nuisance. The fungus gnat (*Family Fungivoridae* and *Family Sciaridae*) are very common in buildings.

A SNAPSHOT OF TREATMENT OPTIONS

Exclusion

Caulk cracks and crevices, seal doors and windows, and install door sweeps (shown) to help prevent fly entry.

Sanitation

Place exterior dumpsters as far away as possible and implement an odor control program to help eliminate fly attractants.

Mechanical Control

Wall-mounted Insect Light Traps attract flies with their light, and are available in a variety of styles.

House Flies – While they are commonly found in office or retail environments, they are more apt to be an occasional invader instead of a long-term resident due to the lack of food available. Remember the surrounding environment may be the breeding site, and open doors and negative air pressure may be drawing house flies in.

Vinegar or Fruit Flies – These generally come from employee storage or break room areas where staff improperly store food or leave out fruit, vegetables, dirty dishes and trash. They can also be brought in on shipments with fruits and vegetables.

Drain Flies – These flies reproduce in waste drain lines, often lines that are not used or toilets that are not flushed regularly. While they don't bite or contaminate our food, they can bring pathogens from the sewer lines.

Gnats – These tiny flying insects come in with office plants and include fungus gnats. Overwatering plants can cause the eggs in the soil to hatch because of the excessive moisture. Beyond plants, though, many people call any small fly a "gnat" – even small filth flies. The fungus that grows in damp soil is the food source for this fly's larvae.

Enlisting the Help of Employees

In a non-food handling business, such as an office or retail establishment, educating employees is extremely important to an effective pest management program. As with food handling facilities, the practices of inspection, sanitation, exclusion and trapping can also be applied.

Employees may unknowingly contribute to a fly problem by leaving food or odor-causing trash that can attract pests. The odor created by decaying organic matter attracts flies looking for a food source or breeding site.

Encourage employees to use sanitation techniques to keep flies at bay. Remove food sources wherever possible in kitchen or break room areas. A pest management professional should provide free staff training to help employees know what to look for and how they can contribute to the IPM program.

CHEMICAL REMEDIATION

Insecticide use should only be considered as a supplementary measure to non-chemical remediation efforts such as sanitation and building maintenance. Chemical treatments should only be applied as a last resort by a licensed, trained pest management professional.
Let's take a look at the three most common forms of chemical remediation for flies and considerations of each:

- **Baits** – Baits are materials that contain an attractant and active ingredient that will kill flies that consume and/or touch it. Frequent replacements may be needed as some baits typically have a short residual period. Baits are not effective against all species of flies. House flies are most impacted by baits.
- **Residual Treatments** – Residual liquid chemicals may be used to help eliminate and prevent fly populations around the exterior of a building. Residual treatments should only be used where the likelihood of food contamination, contamination of food surfaces or exposing building occupants is not a problem.
- **Non-Residual Treatments** – Fogging can be used in cases where the quick elimination of an interior fly problem is necessary. However, fogging does not provide long-term control.

RECOMMENDATIONS

Flies are much more than a mere nuisance to businesses, and can present a challenge to almost all types of establishments. Because they can transmit disease, they are not acceptable at any level.

The good news is that there are many effective ways to combat flies. Every fly situation is different, so there is really no set blanket approach for this type of pest. Identifying the type of fly plaguing your establishment is the first step towards creating a treatment plan that's right for your business.

Remember, flies are never the problem, they're the symptom of a problem. Once you get rid of any issues at your establishment that may be attracting or causing flies to thrive, you can rid your establishment of them.

You don't have to live with a fly problem. Awareness, identification and being proactive are key to protecting your establishment – and your bottom line.

MORE BUZZ ABOUT FLIES

Additional Resources

National Pest Management Association
www.pestworld.org/flies

***Pest Control Technology*: Annual Fly Control Issue**
http://66.181.99.28/PCT1106_thinkFly.aspx

Orkin Commercial Services
www.orkin.com/commercial/services/fly-control

About the Authors

Greg Baumann is Vice President, Training and Technical Services, for Rollins Inc. A degreed chemist and licensed pest management professional, his global pest management experience spans 30 years. For more information, e-mail gbaumann@rollins.com.

Ron Harrison, Ph.D., is an entomologist and Director of Technical Services for Orkin LLC, and an acknowledged leader in the field of pest management. For more information, e-mail ronharrison@rollins.com.

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