



# SMALL FLY & COCKROACH CONTROL PROTOCOL

FOR COMMERCIAL FOOD FACILITIES



**NISUS**<sup>®</sup>

Better science for a better world.

# INTEGRATED PEST MANAGEMENT (IPM) FOR SMALL FLIES AND COCKROACHES IN COMMERCIAL FACILITIES USING NISUS PRODUCTS

(ALWAYS READ, UNDERSTAND AND FOLLOW THE LABEL AND REGULATIONS COMPLETELY BEFORE ANY APPLICATIONS.)

## TOOLS

Adequate supply of preferred product(s):



Foam Fresh®



Nibor-D® + IGR



Bac-Azap®



ProFoam® Platinum



Nibor-D®



Nisus DSV™



Niban®



Niban® -FG



Magnetic Roach Bait®



Fireback®

## INSPECTION TOOLS AS NEEDED

Professional flashlight

Inspection mirror

Putty knife or scraper

## APPLICATION EQUIPMENT AS APPROPRIATE FOR JOB

Professional foaming equipment and accessories

Hand pump sprayer

Drain brush

## OTHER

Possess any required government credentials to perform work

PPE as required by label and regulations for work being done

Gloves and safety glasses for drain cleaning

Notebook or electronic tablet for notes and service record documentation

## INTRODUCTION

Integrated pest management programs for small flies and cockroaches can be challenging in commercial food handling or processing sites. These facilities are frequently large, commonly with many employees and many areas conducive to small fly and cockroach issues. To provide the best service, integrated pest management procedures must be used and can be expanded to include the following major steps:

### I-D-E-N-T-I-F-Y

**I. Inspect the account** - both the interior and exterior.

**D. Determine levels of decay and identify the pests** - using credible sources, identify the species of flies so the biology and behavior information can be utilized to implement management tactics.

**E. Examine and determine the source of the infestation** - this may be inside or outside and is often associated with a sanitation issue.

**N. Note any existing pest, sanitation, or maintenance corrective actions needed** - this will establish a record of identified pest, sanitation issues and areas of concern.

**T. Target steps for exclusion** - to prevent the entry of flies and cockroaches from the outside or spreading from one area to the next

**I. Initiate a custom fly and cockroach management program using Nisus products** - this plan should incorporate sanitation, the removal of food/breeding sites, pesticide applications, pest monitoring and the customer's participation.

**F. Formulate a plan of evaluation** - Monitor the success of the program by using collected data and adjusting the program as necessary.

**Y. Yield results for your clients** - Continuously re-evaluate and reassess conducive conditions, threats, and new pests.

## INSPECT THE ACCOUNT

The first step of an IPM program is to inspect the facility to determine which flies may be present, where they are, where food sources are located, and any entry points they may be using to gain entry. Since small flies and cockroaches are typically found in areas with moist, organic build-up, some starting points are:

- Drains (in production and non-production areas)
- Wash pits, utility sinks and mop sinks
- Cracks in the floor and grout
- Cracks in walls or baseboard areas (look for roof leaks)
- Under equipment where food build-up may be occurring
- Inside equipment housings
- Food storage areas (including incoming raw ingredients, in process, and finished products)
- Garbage and recycling receptacles
- Equipment with motors such as vending machines, refrigerators, microwaves, mixers, etc.
- Low spots where water may pool after washdowns
- Water from roof leaks, water leaks and condensation from pipes and equipment
- Office areas, lunchrooms and locker rooms
- False ceilings and wall voids

While small flies and cockroaches typically originate inside facilities, it is important to perform exterior inspections, as well. Small fly populations could be coming from:

- In and around dumpsters and recycling areas
- Roofs
- Overgrown areas with vegetation holding standing water
- HVAC systems and condensate drains
- Sewage leaks
- Grease traps
- Neighboring facilities
- Open doors and unscreened windows
- Dock doors and dock ramps
- Trash or refuse found around the facility or other nearby places where organic materials have been spilled.

Determine if the facility is maintaining adequate sanitation levels. Review the cleaning program and determine any changes or additional areas that require attention. Work with management to seal off any openings that may allow small flies or cockroaches to enter. If one primary source of an infestation is found, continue to search. A thorough inspection will evaluate all potential sources of small flies and cockroaches. If monitoring devices are in place (such as insect light traps or sticky traps), inspect, identify the insects and document areas where they inhabit. If written pest control records (service reports) or pest sighting logs are present, these should be reviewed for past issues.



Often, a single visit is not sufficient to fully identify all the conducive conditions that exist. It can be helpful to schedule follow-up visits to review the site again. It is also advised to visit the site at different times and talk to employees working on different shifts. This allows for a better overall picture of changing conditions and provides additional eyes to spot issues before they become problematic.

## **DETERMINE THE LEVELS OF DECAY AND IDENTIFY THE PEST(S)**

One of the best ways to solve small fly issues is to understand the 4 primary levels of filth and decay, and which small flies are associated with each level. This will also help concentrate the search for breeding materials and conducive conditions for each pest species.

**Level 1. Moth/Drain Flies: Gelatinous Biofilms** - Recent deposits in drains, ice machines, etc.

**Level 2. Red-Eyed Fruit Flies: Early Decay** - Fermenting fruits, vegetables, spills and decaying organic matter, fermenting liquids, mop water, etc.

**Level 3. Dark-Eyed Fruit Flies: More Advanced Decay** - Organic materials in a further stage of rot. Food particles in drains, cracks, under floor tiles, recycling bins and beer stations. These flies may also infest Level 2 decay.

**Level 4. Phorid Flies: Late-Stage Decay** - Garbage residue, sewage, rotten food, mulch, dead animals, feces. However, phorids are unique because they infest a wide range of decay levels and breeding materials (Levels 1-4).

## **IDENTIFICATION OF FLIES**

The most common flies found in commercial food facilities are drain flies, red-eyed fruit flies, black-eyed fruit flies and phorid flies.

### **Moth/Drain Fly (Psychodidae)**

Drain flies (also called moth flies, filter, and sewage flies) are small, robust-bodied, dark, fuzzy-looking flies. They range from around 1/16" to 1/8" long and are typically dark gray to tan. Antennae are 12-16 segmented with

long hairs on each section. They are weak fliers and are often seen running and hopping or flying slowly in an erratic manner for short distances, usually near water or food sources. Adults can be found clinging to walls in kitchens, bathrooms and on equipment or surfaces near food sources. Mature legless and eyeless larvae



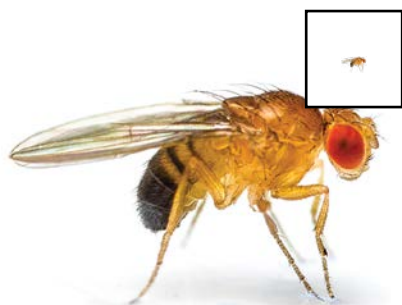
are 1/8-3/8" long and have a distinct head and a breathing tube that allows them to breathe in wet environments. A life cycle develops in 7-14 days, depending on conditions and temperature. While adults only live a few days,

the females will lay up to 100 hundred eggs in small masses on the biofilm – the gelatinous organic layer that accumulates on the side of drains or other damp areas. The developing larvae will then feed on that material, grow and develop into pupae, finally emerging as adults to start the life cycle again.

**Vinegar Fly/Red-Eyed Fruit Fly (*Drosophila melanogaster*)**

Red-eyed fruit flies are small flies approximately 1/8" long and slightly less wide. They are pale brown with distinctive bright red eyes. Antennae are 3-segmented and have a feather-like bristle (arista) on the 3rd segment. While they are stronger fliers than moth flies, they generally do not fly far from their food sources. Nearby light sources are attractive. They are mainly known to be associated with fermenting fruits and vegetables but can reproduce from almost any wet or moist decaying organic matter found in a facility. Mature

legless and eyeless larvae are 1/4-3/8" long, white or cream colored and tapered towards the head. Adults are relatively short-lived but will lay around 500 eggs in that time. A

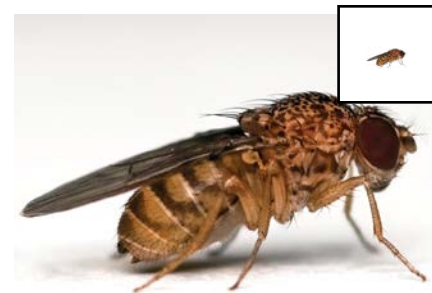


typical life cycle develops in 8-21 days depending on conditions and temperature. However, it can take as little as seven days for the egg to develop into a reproductive adult in ideal wet and warm environments

**Black-Eyed Fly/Dark-Eyed Fruit Fly (*Drosophila repleta*)**

This fruit fly is very similar to the red-eyed fruit fly but is slightly larger at almost 1/6" and has a blackish-brown body with black speckles on the upper surfaces. As the name suggests, they have dark red eyes and darker wings. Mature legless and eyeless larvae are very similar to those of the red-eyed fruit fly but slightly larger.

These flies can develop and feed in many of the same areas as the red-eyed species but are found more often around drains, under loosened floor coverings like linoleum and tile and in bar and food prep areas. In food processing sites, the legs around equipment are key spots, as well. Its life cycle runs about the same time as the red-eyed species.



**Phorid Fly/Humpback Fly (Phoridae)**

This is a family of very small (1/64-1/8") flies that resemble fruit flies. They are also commonly called humpback, coffin and scuttle flies. Because they have a small head and a characteristic "hump-back" shape when viewed from the side. They are usually tan to brown with dark eyes. They tend to run across a surface (or "scuttle") to escape rather than taking immediate flight. Phorid flies will feed and develop in moist decaying matter, often sewage and decomposing animal material.

Larval phorids are not often seen, but mature



legless and eyeless larvae are spindle-shaped and approximately 1/3" long, white or cream colored and tapered towards the head with projections on the posterior segments. They are somewhat more flattened than fruit fly larvae. Depending on the species, they may lay up to 750 eggs. Their life cycles can range from 14-35 days.

### **Other Flies**

Other possible flies could include little house flies, fungus gnats and large flies, depending on the type of decaying organic material found in and around the commercial location. A good resource for help with detailed identification and basic biology information is the NPMA Field Guide to Structural Pests.

### **IDENTIFICATION OF COCKROACHES**

The four most common cockroaches in commercial kitchens are American cockroaches, Brown-Banded cockroaches, German cockroaches and Oriental cockroaches. As in small flies, developmental times vary widely in cockroaches. Much of their egg to adult maturation is a product of temperature, with higher temperatures resulting in much faster development.

#### **American Cockroach (*Periplaneta americana*)**

American cockroach adults are the largest peridomestic cockroach at 1 1/2"-2 1/8". They are reddish brown with a yellow pattern on the pronotum. American cockroaches prefer cool, wet and dark environments. They will reside in the cooler parts of the kitchens. Lower cabinets, mop areas, storage areas, mechanical rooms, sewers and dumpster areas are prime locations. Females produce

approximately 10 egg sacs per year containing approximately 15 eggs each. They are moderate fliers with large wings and will often fly into areas at dusk. Development is fairly slow compared to other cockroaches. The egg-adult stage is about 600



days. Adults may live another 400 days or more after becoming adults. Due to their long life cycle, population growth rate and size, American cockroaches are known for causing quite a bit of damage in a short period after populations build. This is a major reason to eliminate American cockroach populations when they are first reported.

#### **Brown-Banded Cockroach (*Supella longipalpa*)**

This species is a small domestic cockroach (about 1/2") that exhibits dark bands across the body on nymphs and adults and a dark bell shape on the pronotum. The Brown-Banded cockroach prefers higher areas that are warm and is most likely to be found in upper kitchen cabinets, false ceilings, wall and ceiling molding and appliances. This species is primarily nocturnal and tends to remain in its harboring areas until kitchens have closed. They will feed on anything nutritious. Adult females produce about 14-15 egg capsules with about 15 eggs each. The egg-adult stage is about 80-90 days under ideal conditions. The average adult may live for 200 days but there is a wide range of survival for this species.



#### **German cockroach (*Blattella germanica*)**

German cockroaches are small (1/2-5/8") brown to dark brown domestic cockroaches that are identified by two dark stripes located on the back of their pronotum. German cockroaches are found especially frequently in institutional facilities such as commercial kitchens. This species prefers warmer temperatures and will harbor in small cracks and crevices near food and water. Adult females produce about 5 egg capsules with 30-40 eggs each. The egg-adult stage is about 60 days and the German cockroach is one of the most rapid reproducers of all cockroaches. The average adult



may live for approximately 100-200 days with females generally outliving males in the population.

### **Oriental Cockroach (*Blatta orientalis*)**

Oriental cockroaches are a larger species (about 1" long) and are reddish to dark brown or black. Males have short wings that cover 3/4 of their body while females only have very short reduced wings that appear similar to juvenile wingpads. Both males and females are flightless. Much like American cockroaches, this species is peridomestic and will often be found primarily on the outside. They will, however, move to the interior of a structure searching for food and moisture. Therefore, exterior measures are imperative to their control. Oriental cockroaches prefer warm, damp areas and can often be found in basements, crawl spaces, sewer and plumbing pipes, under sidewalks and between soil and the foundation. Adult females produce about 8 egg capsules with 16 eggs each. The egg-adult stage may take anywhere from 150-800 days, leading to slower population growth. The average adult may live for approximately 30-180 days.



## **EXAMINE AND DETERMINE THE SOURCE OF THE INFESTATION**

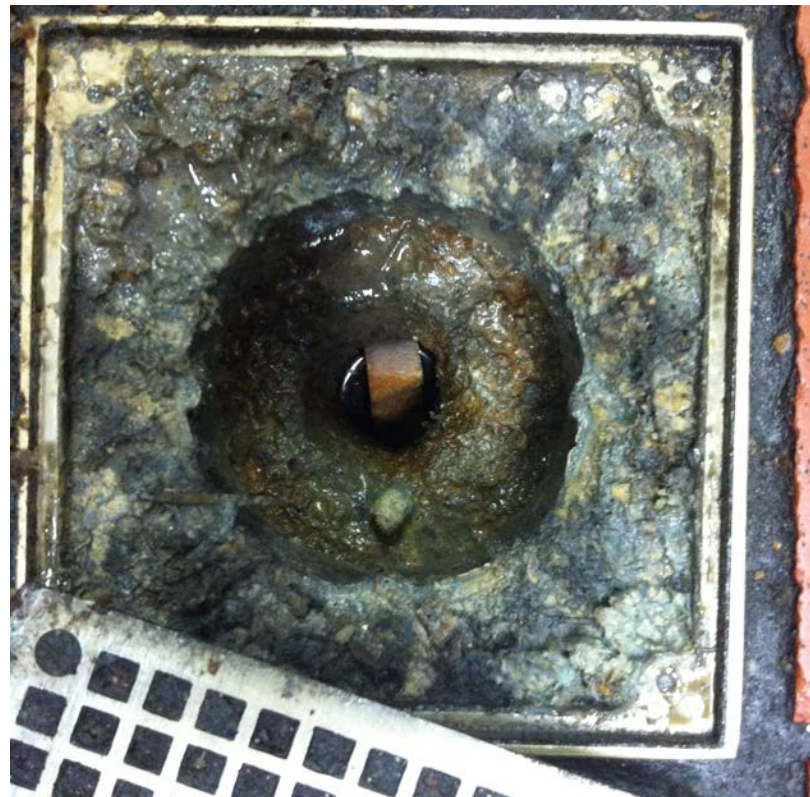
Sanitation is always difficult to judge in a food processing facility because the facility is often in constant operation and food is ever present. Spillage, as well as other waste products, will always be a part of that process. Thus, determining what is "normal" and what may be excessive is a challenge, particularly if the judgement is made based on a single visit. Every effort should be made to inspect all areas and document all conducive conditions.

### **Raw/Incoming Ingredients Areas**

Incoming ingredients such as fruits, vegetables and animal materials may arrive with flies, fly eggs or larvae. The same is true of wet or damp materials. Encourage the

facility to develop a process for inspecting all incoming goods for pest issues. If possible, review the intake forms for past issues. Focus inspections on these high-risk items and the areas around where they are stored. In food processing and handling facilities, incoming ingredients are typically stored in an initial warehouse before being transported to processing. While these pre-production areas are not often subjected to wet washdowns, water can still be an issue. Look for any water leaks from roofs and walls and inspect all drains in the warehouse. Since phorid flies are often found breeding in sewage, check for floor cracks that may indicate a broken sewer pipe under the floor. Check around doors for evidence of water and to ensure the doors seal sufficiently. If daylight can be seen around a closed door, it is not sufficiently sealed to prevent insect entry.

If there is a drain (or several) that appears to be a likely small fly harborage, you can try the drain trick. Use a 12-16oz plastic cup and line the inside with a small glue board, double-sided tape or oil. Invert the cup over the drain and come back in a few hours. If flies are in the drain, some will have been caught on the sticky surface in the cup. This way, drains with flies can be prioritized for cleaning.







Pallets of incoming goods are often brought in from outside or other storage areas. If pallets are not sufficiently cleaned/treated, they may be wet, moldy, have food residues or soil that could harbor small fly larvae. The facility should be conscious of this and inspect the pallets when bringing them inside.

Also, some food processing facilities have small offices for employees and shippers that may have food and water resources necessary for small fly development. Check for refrigerators, vending machines, water coolers, ice machines, water fountains and bathrooms in these areas.

### **Processing Zones**

In areas where food is processed, be sure to look for spillage that looks older, less fresh and/or that may have been there for days (or longer). These areas are either not being addressed or are being missed on the sanitation schedule. If any of these areas are damp, moist or wet, they provide the perfect conditions for small fly development. Any drains in the processing areas should be inspected. If the area is subject to wash-downs, check for low spots where standing water may pool. It helps to have a small metal spatula or another narrow scraping tool to dig into cracks, crevices, drains, food buildup and other areas that may be harboring fly larvae. Since the maggots are within the substrate (and not on top of it), digging down a little can show when larvae are present.

Processing and cooking areas have many pieces of equipment that food can get stuck on, under and inside equipment casings, motor housings and legs. Since many food facilities and restaurants are often in operation 24/7, it will be difficult to open and inspect all processing or cooking equipment. It can help to have an individual from the site (facilities, maintenance, or management) help open and inspect what can be realistically inspected. Be cognizant of interrupting normal operations and never open equipment without prior authorization. Since adult flies are not far from their source, it helps to stand still for a minute and watch—if you see adult flies resting on pieces of

equipment or flying near certain equipment, those should be prioritized. Try to infer from the surroundings (damp areas vs dry areas, areas where sanitation is an issue, etc.) which equipment may be suspect and try to focus inspection efforts on those areas.

There are typically many types of trash bins from actual trash and recycling to rework material and raw ingredients. In food preparation and processing areas, these bins rarely have plastic liners and should be cleaned regularly. Inspect the bins (as often as possible) for old food debris that may be damp and harbor fly larvae.

Check the sanitation schedule and try to confirm if daily/weekly/monthly items are being done and completed sufficiently. If the schedule or records are not accessible, discuss with the facility contact.

Many facilities clean their drains. However, they are not often adequately cleaned or cleaned using the right products. Too often, drain cleaners are just dumped down the drain and not carefully applied around the edges to target the organic buildup. Ensure they are using a foaming bio-sanitation cleaner regularly, particularly on the worst drains.

### **Finished Goods Areas**

These areas are similar to the incoming goods areas in that they are typically set up like a warehouse (see the





**Cleaning Closets:** Many food processing facilities have a closet or small area where cleaning supplies are kept. This often includes mops, mop buckets, brooms, dustpans, sinks and more. Dirty mop heads and residual liquids left in mop buckets are all key areas for small fly development. If the facility has industrial floor cleaners, check those—the inner compartments are often overlooked and dirty water/debris accumulates inside them.

## NOTE ANY EXISTING ISSUES AND CONCERNS

Document all pest issues and all conducive conditions the facility needs to address in Processing Zones, as well as in Raw/Incoming Ingredients, Finished Goods and Non-Production areas. Also, be sure to recommend that the facility follow “first in, first out” (FIFO) procedures in which the oldest ingredients get used first. The longer products sit without being used, the more chance they have of becoming infested.

## TARGET STEPS FOR EXCLUSION

Small fly issues usually originate inside a facility but outside issues should still be addressed. Have the facility seal all doors and windows (if present). Remember, if daylight can be seen around a closed door, small flies and other insects can gain entry. Look for additional entry points such as vents, conduits, pipes, fans and other openings small flies may use. Ensure that the facility seals or screens these locations.

"Raw/Incoming Ingredients" section). As before, check any drains, and look for water leaks, wet spills and debris. Since there are typically many dock doors, be sure to check the door seals to ensure any outside flies cannot gain entry.

### Non-Production Areas

These areas might include offices, breakrooms, locker rooms, maintenance or mechanical rooms and any other areas outside of production and storage. Small fly issues in these areas will be present in drains, behind/around refrigerators and vending machines, inside coffee makers, around ice machines and in trash bins that have not been cleaned inside the liners. Recycle bins are often overlooked and with the number of cans and bottles that have small residual sugary liquids, they can quickly become infested.

Also be sure to check for water leaks under sinks in kitchen and bathroom areas, particularly in areas that may have loose tiles, linoleum, baseboards, or grout that is breaking down. Specific areas of concern in bathrooms include around the base of toilets and urinals, drains, or trash receptacles. In other words, any place where water or fluids may be found due to leaks, handwashing, etc., should be inspected.





entrance of flies and other insects into the facility from the drains. Drains should be cleaned before installation of any trap seal.

## INITIATE A CUSTOM FLY AND COCKROACH MANAGEMENT PROGRAM USING NISUS PRODUCTS

Each account will have different needs and specific challenges. Every facility should have a custom program in place to suit the needs of the facility and obtain the best results. This program should include sanitation, exclusion, trapping/monitoring devices and treatments. Any plan that is developed should be presented to the primary contact or manager on site for their approval and buy-in. Keep in mind that the individual overseeing the pest control program for the facility has many other responsibilities and does not have the same background and experience as a trained pest management professional. Make sure that the program is clear, concise, and reasonable. Since their help is necessary to do the sanitation and exclusion tasks, it's important that they understand and actively partner with you for the best results. It is helpful to prioritize and provide the customer with a Top 10 list, especially when many sanitation and exclusion issues exist. Such actions can help make your program suggestions seem more reasonable and less overwhelming for individuals without professional

Phorid flies can use cracks in the floor to come into a facility when sewage problems exist in the soil beneath the site. Identify all major cracks in the floor and expansion joints to be sealed. Ultimately, the contaminated soil must be treated or removed to eliminate phorid flies. However, sealing the floor can minimize the number entering the facility.

If one area is prone to small fly infestations, consider options to seal it off from other portions of the facility so that the infestation is more contained and thus easier to treat. Examine door seals on all internal doors and other areas that connect one section of the facility to another. Pay special attention to doors and/or openings directly adjacent to dumpsters and trash areas. Flies are likely in the debris around dumpsters, compactors and recycling containers and can easily enter through unsealed doors.

Exclusion is also possible in drains to a degree. Drain inserts or trap seals can be used to prevent small flies and cockroaches from coming up through drains into the facility. There are permanent drain caps that seal off unused drains. There are also one-way inserts available that allow water to flow into drains but prevent insects from rising out of them. These implements do not remove the need for cleaning but can help mitigate the



training in pest management. Plus, with this method, the most severe issues can be addressed first and items that are a lower priority can be dealt with afterwards.

### **DRAIN CLEANING AND BIO-SANITATION**

Cleaning drains and reducing organic buildup are essential to any small fly and cockroach protocol. Physical removal is often required when heavy buildup is present. There are several options for drain brushes, pressure washer drain jet kits and professional drain cleaning and clearing equipment available. Clean drains using a solution of Nisus DSV®, particularly in the areas around the drain opening and drain plate as these tend to be key areas that support small fly populations. After drains are cleaned (or in cases of light buildup), apply either Nisus Foam Fresh® Bio-Sanitation Foam or Bac-Azap® to reduce organic material and help reduce future buildup. These products are also useful as the very first step in cleaning efforts to help loosen and remove years of grease and grime.

Note that there are several professional foamers available to the industry and that Nisus offers a line of products used for foaming.

### **APPLYING NISUS PEST CONTROL PRODUCTS IN COMMERCIAL FACILITIES**

When infestations are large, widespread or simply difficult to control due to sanitation and excessive food supply, insecticides can be used to reduce populations rapidly and can aid in long-term control and prevention strategies.

#### **Drain Treatment for Small Flies and Cockroaches**

Cockroaches and small fly larvae and adults are often found in and around drains. Foam is an excellent delivery mechanism to deposit insecticide 360° onto sidewalls of pipes where these insects are found. Using standard foaming equipment and the appropriate mix of Nibor-D® and ProFoam® Platinum foaming agent with either DSV or Bac-Azap, apply foam deep into the drain past the p-trap. This process kills adults while the Nibor-D diffuses

into the slime coating to contaminate food sources, making the food material toxic to pests.

If you do not have access to foaming equipment, you may substitute a liquid solution to pour into drains or for use as a mopping solution. However, note that foam will provide superior results. Nibor-D can also be applied as a dust to perform the same function. Another option is Nibor-D® + IGR, a mix of Nibor-D and an insect growth regulator that comes in a foaming aerosol can with a 17" semi-rigid applicator hose.

See the section below for details of products and procedures for foaming.

### **Crack and Crevice Treatments**

Similar to drains, foam may be used to apply a Nibor-D mixture into cracks, crevices and voids, filling areas where pests hide and leaving behind a residual on all vertical and horizontal surfaces. This means that one solution can be used in multiple areas, making service more convenient. Search for areas that remain moist and have



a buildup of organic debris such as missing grout and cracked tiles on floors and walls, pipe penetrations, voids, etc. A liquid treatment using a Nibor-D solution may also be sprayed in these areas in the place of foam. Nibor-D can also be applied as dust in these areas. When cockroaches are found in cracks and crevices in non-food handling areas and exterior areas, Fireback® Bedbug & Insect Spray & Jet can be applied to provide a quick knockdown.

### **Cockroach Baiting Success With Magnetic Roach Bait™ (MRB) and Niban® Granular Bait**

For general cockroach control, focus on sites with the highest activity first. This approach will help reduce cockroach movements from one area to the next. Multiple small deposits of MRB should be applied close to or within a few feet of harborage areas. Cockroaches tend to feed close to home and will often feed on the first item they encounter. Apply the bait wherever harborages are found, being sure to inspect thoroughly in known problem areas such as behind stoves, sinks, refrigerators, dishwashers, storage areas, pipe penetrations, near drain grates, etc. When cockroach pressure is exceptionally high, consider applying bait into stations.

Due to the rapid reproduction of most cockroaches, it is important to rotate baits. Changing classes of active ingredients will help prevent resistance from developing in populations and varying food ingredients found in the bait matrix will help continue to attract them. Adding Niban Granular Bait can protect against infestations that originate on the exterior, which is particularly useful in the case of American and Oriental cockroaches. Apply Niban in key areas around the perimeter, near dumpsters and other areas likely to harbor or attract cockroaches. Niban Fine Granular Bait (FG) is a versatile solution for applying bait in difficult-to-access areas where gel or paste baits may not be a viable option. Using a standard bulb duster, apply Niban FG to all areas where cockroaches inhabit and travel.



Remember to avoid any contamination of feed or food when applying. In food and feed handling areas or in serving areas when food is exposed, applications should be limited to crack and crevice treatment. Keep in mind that many food facilities power wash or hose down the entire kitchen daily. Such sanitation schedules may alter where and how often you need to apply pesticides at the facility.

## **FORMULATE A PLAN OF EVALUATION**

A key component to ensuring the success of your pest management program is being able to evaluate the level of progress being made or keep track of any setbacks. The following strategies can help formulate an effective evaluation plan.

### **Pest Sighting Log**

There should always be a pest sighting log at each facility. Employees often see issues quickly because they are on the job every day. Encourage the facility to train employees on who to tell when they see a pest issue and what information is helpful. It is beneficial to offer training or training materials to the site and encourage employees to speak up when they see a pest issue. Everyone should know the location of the pest sighting

log, as well as understand how and when to use the log. Employees should know that early detection is extremely important to controlling insect issues.

Sometimes, a new account is gained due to a panic call from the facility because of customer complaints or a health department inspection. Ask to review any documentation to get a full picture of their needs but never over-promise. The pest management company provides a service, but the facility is responsible for doing its part.

### **Insect Light Traps and Insect Monitors**

Insect light traps (ILTs) can be used to monitor and provide some control of flies but should not be used as the only fly management technique. They need to be placed strategically and should never be placed above food contact surfaces. ILTs are often placed near doors to intercept incoming flies but they should not be installed too close to any opening as they might attract flies from the exterior. Insect monitors should be placed strategically when dealing with cockroaches to determine potential sources of infestation.

In food processing areas, large industrial ILTs are most often used for the greatest capture surface and best light output. Smaller units and decorative units may be placed in non-processing areas like dining rooms, offices or breakrooms.

Since small flies are not strong fliers, they will often be near their food/breeding source and ILTs are typically too far away to be effective. Small ILT units or temporary units can be used near hot spots to capture and monitor small flies. It is essential to document how many flies and cockroaches are captured each visit in each device. This information should be used to identify if populations are increasing or decreasing (i.e., if treatments are working or not) and the location of problem areas that require additional sanitation or exclusion.

## **NISUS SOLUTIONS FOR COMMERCIAL FACILITIES**

Always read, understand and follow the label, and comply with any regulations before using any product.

### **Nibor-D Insecticide**

Nibor-D is a highly versatile borate compound formulated for use as a dust, liquid, foam or mopping solution. It can be used as a crack, crevice, void or spot treatment and as a drain treatment to control small flies, larger flies, cockroaches, ants and other insects. It is one of few management products which can be used in and around drains. Nibor-D can be applied as a dust using any standard bulb duster, powered duster, brush or other dusting devices.

This treatment enables Nibor-D to coat organic debris in areas where flies may breed and develop. Nibor-D diffuses into the slime coating of the drain (the area where the larvae [maggots] are feeding) and contaminates their food source, rendering the food material toxic to larvae as they feed. This action eliminates the larvae and prevents any eggs deposited from continuing their life cycle. This treatment can also be applied to cracks and crevices in walls and tile grout where organic food particles may collect.



## Liquid and Foaming Applications

For drains and mopping: One 8 oz. packet (or 5 scoops\*\*) per gallon of water for a 5% solution as a liquid or foam

For drains or other areas: Two to three 8 oz. packets (or 10 to 15 scoops) per gallon of water for a 10% or 15% solution as a liquid or foam.

Note: We recommend using at least a 10% solution mix for initial treatments. As the pest pressure decreases, a 5% solution may be adequate to contain the pest issue. Use a 15% solution for severe infestations and high insect pressure.

For ease of mixing, Nibor-D should be mixed in a separate container before adding to the spray or foamer tank. If mixed in the tank, make sure the solution is thoroughly combined by stirring or shaking in order to get a uniform solution (approximately 4-5 minutes).

Important: Make sure tanks, hoses and strainer filters are completely washed with water and cleaned of any residues at end of every workday as residues may clog hose lines and spray tips. Borate residues may be more visible when mixing Nibor-D in water with a higher mineral content (hard water).

Nibor-D can be used in conjunction with any insect growth regulator (IGR) such as pyriproxyfen, hydroxyflorfen or methoprene, a fungicide/mildewicide, disinfectants or a non-residual knock-down adulticide or larvicide.

Note: Ensure that the IGR chosen is allowed on or in the application site.

\*\*Scoops are provided with each 5lb and 15lb container.

## Nibor-D Insecticide Foam + IGR

Nibor-D Insecticide Foam + IGR is a versatile and convenient can of ready-to-use foam that combines Nibor-D with pyriproxyfen. It is especially convenient for drains and other smaller voids where a ready-to-use

aerosol foam is preferred over large equipment. It is also useful for follow-up appointments, spot applications or trouble spots that need to be serviced between regular visits. It can also reach past the p-trap with its 17" semi-rigid extension hose (included with every can). The insecticide effectively turns residual food particles and biofilm into an insecticidal bait to kill adult flies and developing larvae while the insect growth regulator disrupts growth and reproductive systems.

## Nisus DSV

DSV is a broad-spectrum disinfectant, sanitizer, virucide, mildewstat, fungicide and deodorizer. It is also labeled as a contact pesticide to kill small flies and larvae in drains and other areas. Nisus DSV can be used in conjunction with Nibor-D and other control products for drain treatments.

## Foam Fresh

Foam Fresh is not a pesticide or control product. It is a bio-sanitation foam that eliminates organic odors and removes fats, oils, and grease build-up in drains and other areas. With its 17" semi-rigid extension hose (included with every can), it can reach past the







p-trap in drains to target organic matter. It is perfect for allowing customers to easily target filth areas like sink drains, bar mats, mops, garbage cans and areas under stainless steel equipment between scheduled services.

### **Bac-Azap**

Like Foam Fresh, Bac-Azap is not a pesticide but rather a bio-sanitizing liquid made from a special blend of microorganisms that work to consume organic matter in drains, cracks, voids, surfaces and other areas. Bac-Azap also targets odors and eliminates them at their source. The microorganisms in Bac Azap are uniquely formulated to work in conjunction with the Nibor-D control products when both are applied into and around drains.

### **ProFoam Platinum**

ProFoam Platinum is a unique blend of foaming agents to be used with foaming equipment to transport and distribute insecticides and other products in a three-dimensional treatment on all surfaces in applications such as, drains, wall voids, cracks, crevices and other areas. Generally, 2-3 ounces of ProFoam Platinum per gallon of water will give an ideal foam but concentration may be adjusted to address specific needs or variations in water hardness and foaming equipment.

### **Magnetic Roach Bait (MRB)**

MRB is a proven cockroach bait with years of efficacy to support its success. The formulation remains edible and attractive, even in the presence of competitive food sources for an extended time. MRB is effective on large and small cockroaches. Apply MRB in cracks and crevices near cockroach harborages.

### **Niban Granular Bait & Niban Fine Granular Bait (FG)**

Niban is a specially formulated weatherized granular bait that provides pests with an attractive food source long after other baits break down. Apply Niban or Niban FG as a crack and crevice treatment for longer-term control of cockroaches and protection against

infestation in commercial facilities.

### **Fireback Bed Bug & Insect Spray & Jet**

Fireback is a combination of contact and residual protection that is especially useful to knock down cockroach populations fast. Use Fireback in non-food handling areas in cracks, crevices and voids where cockroaches harbor. Do not use in food areas of food handling establishments, restaurants or other places where food is prepared, processed or present.

### **Combining Nibor-D or Nibor-D + IGR with Nisus DSV for Faster Kill Plus Disinfection**

Nibor-D can be combined with DSV to give a faster contact kill for flies in drains and to disinfect at the same time. Simply add 1.1 oz. of DSV to the Nibor-D solution. To use as a foam, add 7-8 oz. of ProFoam Platinum to this solution to get the proper foaming ratio or use Nibor-D Foam + IGR. The active ingredient in Nibor-D will continue to penetrate the organic layers in the



drains and other surfaces to kill developing fly larvae.

### **Combining Nibor-D or Nibor-D Foam + IGR with Bac-Azap for Drain Cleaning for Flies and Cockroaches**

Bac-Azap is specially formulated to work with Nibor-D and other control products available on the market. When combined with Nibor-D, you not only get fly control in the drains but gain the advantage of bio-sanitation to consume and eliminate organic materials and slime layers in the drain and on other surfaces.

Note: Bac-Azap and other microbial products used alone are only drain cleaning agents and no claims can be made for fly control.

For drains, mix 3/4-gallon (3 quarts) water with 1 quart Bac-Azap to make one gallon. Add 8 oz. by weight of Nibor-D for 5% solutions (one 8 oz. packet or 5 scoops) or mix a 10% solution for initial services or severe infestations. Add 5-6 oz. of ProFoam Platinum to the solution. Place the solution into foaming equipment to foam drains.

### **Applications Using Nibor-D Insecticide Foam + IGR And Foam Fresh**

Nibor-D + IGR is ideal for rapid service and smaller jobs when used alone or in conjunction with Foam Fresh. The included full cone spray actuator can be used for spraying surfaces. Use the supplied drain actuator and application tube when treating drains. Extend the tube down to the base of the p-trap and dispense material while pulling the tube out the drain. Dispense until material comes to the drain plate to coat the underside of the plate where larvae and pupae are often found. The application tube is also ideal for crack and crevice applications and the tube can be cut for faster service of application sites.

Dispense material and pull back the tube while continuing to push the drain actuator with extension. Foam Fresh can be applied after Nibor-D + IGR foam has dissipated. Foam Fresh is also equipped with application tubes and space spray actuators for similar application techniques.

## **CUSTOMER PARTICIPATION**



Sanitation is the key to a long-term control program. Your role as a pest management professional is to influence the customer to contribute toward proper pest management by understanding the connection between sanitation and pest infestations. Work with facility management to help develop or adopt more effective sanitation and bio-sanitation management plans and protocols. Help managers communicate the need for thorough cleaning practices that help prevent or reduce fly and cockroach populations. If your company offers this as an add-on service, provide the customer with a price estimate and explain the benefits of having a professional perform this service. You may also choose to partner with a specialized commercial cleaning service. Developing a working partnership with a reputable cleaning service can help elevate your overall management service.

Provide detailed service reports to the facility management based on service inspection and make recommendations on the repair of areas and the progress of the in-house cleaning program. A major key to success involves a bio-sanitation program, a strategy which works best when the treatment is conducted routinely. Since small flies can develop in as little as seven days, weekly deep cleanings are necessary for many areas. Incorporate other areas into a monthly or quarterly pest management program. Bio-sanitation products are cleaners and not pesticides. This allows management to use these products daily to combat organic debris and gelatinous buildup. Bio-sanitation products can be left behind during visits or sold to the facility for use between visits.

## YIELD RESULTS FOR YOUR CLIENTS

Always keep in close communication with the facility management team to ensure sanitation and other in-house control measures are followed. If fly problems persist, re-inspect to determine missed harborage sites, revisit in-house control procedures and consider additional exclusion requirements or other corrective measures. For example, fly traps can help to monitor activity after you have initiated a control program. Ask the manager to keep a log of any pests sighted between visits and review

this pest log each visit. Modify the program as needed to maximize success.

Remember, successful fly and cockroach control in commercial facilities involves control and prevention strategies that include a partnership between the pest management professional and the management of the facility. It is an ongoing process that will create and maintain a healthy environment and a lasting customer.

## SUMMARY

Food production and service facilities are complicated structures because of their size, their operations and the copious amounts of food material they contain. From the filthiest fast-food dive to the most elegant 5-star restaurant, they all may struggle with small flies and cockroaches. Try to consider all the current issues, as well as the conducive conditions that may lead to small fly and cockroach infestations in the future. Form a good partnership with the site so that they understand the necessity of cleaning and how sanitation will help. Good written and verbal communication is essential to success.

For more information on small flies, cockroaches or any of the products mentioned in this guide, visit us at:

**[www.nisusc corp.com](http://www.nisusc corp.com)**



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ALWAYS READ, UNDERSTAND AND FOLLOW THE LABEL, SDS AND REGULATIONS.

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