UNITED STATES POSTAL SERVICE™

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Integrated Pest Management

This instruction describes Postal Service policies and procedures for the Integrated Pest Management (IPM) program that establishes pest prevention and suppression in a cost-effective and environmentally sound manner. Using all appropriate technology and management practices, the IPM program emphasizes nonchemical control techniques over chemical control but does not eliminate the use of pesticides.

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Policy

In establishing an IPM program, the Postal Service implements pest control practices that minimize harm to the ecosystem, human health, and the environment; reduce the need for pesticide applications; reduce pest resistance to pesticides; and minimize pesticide wastes.

In accordance with policy published in the *Administrative Support Manual* 550, Environmental Management, the Postal Service must comply with all applicable environmental laws and regulations governing its activities and will not hesitate to enact more stringent requirements when judged appropriate. The primary concern is for the well-being of employees, customers, and the communities serviced. This position is further defined in the United States Postal Service Environmental Strategy Plan 1993-2000, Environmental Management Policy final draft dated October 1993.

Laws and Regulations

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended in December 1991 by 7 U.S. Code 136-136y, states distinct requirements for the use, storage, transportation, and disposal of general use and restricted use pesticides. The Act also establishes requirements for certification of applicators and permits for the various chemicals and authorizes measures of enforcement.

Other federal regulations governing the use of pesticides and pesticide applications include:

DEFINITIONS

***Integrated Pest Management*—**The use of all appropriate technology and management practices to bring about pest prevention and suppression in a cost-effective, environmentally sound manner.

***Pesticide*—**Any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.

***General Use Pesticide*—**Any pesticide that, when applied in accordance with its directions for use, warnings, and cautions, and for the uses for which it is registered, or for one or more of such uses, or in accordance with a widespread and commonly recognized practice, generally will not cause unreasonable adverse effects on the environment.

***Restricted Use Pesticide*—**Any pesticide that, when applied in accordance with its directions for use, warnings, and cautions, and for the uses for which it is registered, or for one or more of such uses, or in accordance with a widespread and commonly recognized practice, generally may cause, without additional regulatory restrictions, unreasonable adverse effects on the environment. Restricted use pesticides may only be applied by a certified applicator or by personnel under the direct supervision of a certified applicator.

***Certified Applicator*—**Any individual who is certified by training commensurate with Section 4 of FIFRA to use or supervise the use of any pesticide classified for restricted use.

1. U.S. Environmental Protection Agency (EPA) regulations:
   a. 40 CFR 152, Pesticide Registration and Classification Procedures.
   b. 40 CFR 165, Regulations for the Acceptance of Certain Pesticides and Recommended Procedures for the Disposal and Storage of Pesticides and Pesticide Containers.
   c. 40 CFR 166, Exemption of Federal and State Agencies for Use of Pesticides Under Emergency Conditions.
   d. 40 CFR 171, Certification of Pesticide Applicators.
2. Occupational Safety and Health Administration (OSHA) regulations:
   a. CFR 1910.120, Hazardous Waste Operations and Emergency Response.
   b. 29 CFR 1910.134, Respiratory Protection.
   c. 29 CFR 1910.141, Sanitation.
   d. 29 CFR 1926.20, General Safety and Health Provisions.
   e. 29 CFR 1926.21, Safety Training.
   f. 29 CFR 1926.28, Personal Protective Equipment.
   g. 29 CFR 1926.51, Sanitation.
   h. 29 CFR 1926.55, Gases, Vapors, Fumes, Dusts, and Mists.
   i. 29 CFR 1926.57, Ventilation.
   j. 29 CFR 1926.59, Hazard Communication.

State and local environmental laws also may govern the transportation, storage, use, and disposal of pesticides and rinsates.

SCOPE

The elimination of pests in buildings is a distinct facilities service function, not just a custodial function, whether performed and monitored by Postal Service employees or by contract employees. Modern pest management begins with the planning, design, use, renovation, and maintenance of buildings. All employees and functional organizational units of the Postal Service facility must contribute to effective pest management. Organizational units of the Postal Service that must be involved in the IPM program include those with responsibility for sanitation and cleaning, solid waste management, structural maintenance, environmental management, occupational safety and health, employee education, and contract services. All solutions to pest control problems must be the safest and most cost-effective available.

METHODOLOGY

The IPM program methodology includes:

1. Identifying specific pest infestations.
2. Controlling those infestations with short-term solutions, including use of pesticides.

3. Reducing or eliminating the causes of infestation with long-term solutions, such as structural modifications.

IPM Program Attributes

Preventive Approach

Traditional pest control programs tend to ignore the reasons behind the existence of a pest problem and react to an infestation by temporarily removing a small part of the problem by spraying chemicals. The IPM program also includes an immediate corrective action that often depends on pesticides; its main thrust, however, is a preventive maintenance program that aims to control pests by reducing their food, water, hiding places (harborage), and points of entry. If possible, the IPM program must begin in the structural planning and design phase.

Coordinated Management Process

Traditional pest control relies on an exterminator to solve pest problems. The IPM program recognizes that an exterminator generally cannot provide a lasting solution to the pest problem. Solutions generally depend on coordinated management initiatives to upgrade sanitation, housekeeping, environmental monitoring, safety awareness, and facilities repair.

Selective Treatment

Traditional pest control consists of routine applications of pesticides regardless of whether pests are present. The IPM program consists of routine inspection and monitoring of pest populations and treating only if pests are present. Scheduled pesticide treatment without regard for pest population dynamics is neither cost-effective nor environmentally sound. The IPM program can reduce the potential for liability resulting from inappropriate treatments and the resulting unnecessary human exposure to pesticides.

Least Toxic Treatment

Non-chemical control methods should always be considered prior to the use of pesticides. Traditional pest control tends to apply excessive amounts of chemicals to exposed areas far from where needed. Baseboard spraying and room fogging still are widely practiced by the pest control industry. These techniques are not very effective at controlling cockroach and other insect infestations deep within furniture, equipment, or structural elements. The IPM program requires that, when pesticide is needed, it be applied with precision and restraint. It further emphasizes that only the safest compounds, formulations, and methods of application are appropriate. Insecticide baits are usually preferable to sprays. When required, sprays should be limited to crack and crevice applications. Space spraying or fogging should be reserved for unusual situations where no other solution is practicable.

Higher Standard of Expertise

Pest control technicians often are required to do little more than operate a compressed air sprayer for pesticide application. The IPM program requires a much higher standard of expertise. It is essential the Postal Service facility management have access to informed technical guidance concerning all aspects of pest control operations. The applied facilities management aspect of the IPM program requires that the pest controller have as thorough a knowledge of building operations as of pest biology.

Monitoring, Documentation, and Evaluation

The Postal Service facility must maintain an accurate record of pest infestations, control measures used, pesticides applied, and success or failure of control efforts.

Employee and Management Satisfaction

The pest controller's evaluation of performance efforts may not coincide with the opinions of employees and management of the Postal Service. Employee and management satisfaction with pest control within the facility is requisite to a successful IPM program.

IPM Program Objectives

The general purpose of the IPM program is to provide for cost-effective and environmentally-sound pest control procedures throughout all Postal Service facilities.

The specific aims of the IPM program include:

1. Performing the majority of required pest control services by contract.
2. Eliminating scheduled pesticide treatment where practicable and emphasizing regular inspections of the facilities and pest monitoring actions.
3. Maximizing daytime pest control services for most areas to facilitate communication between pest control personnel and Postal Service employees.
4. Employing a conservative approach to pesticide application by using non-chemical treatments whenever feasible and permitting local application of general use pesticides for short-term control of specific pests.
5. Minimizing storage of pesticides in Postal Service facilities and shifting the liabilities involved to contractors.
6. Establishing pest control service frequency based upon the needs of the individual Postal Service facility in a Pest Control Plan.
7. Requiring the contractor to furnish to the Safety Office complete information on pesticide labels and Material Safety Data Sheets (MSDSs) for each pesticide that may be used on Postal Service property. The contractor also must submit pesticide records for each service visit that include the names of the pesticides used, formulations, quantities, and specific locations of application. Where Postal Service employees perform the pest control services, similar recordkeeping is required.

8. Minimizing emergency services. Whether a true risk exists, delivery of emergency services may be required to maintain good public relations.

IMPLEMENTATION

The IPM program has six main components: identifying the pests, defining the ecosystem, creating a monitoring system, establishing injury and action thresholds, developing treatment options, and evaluating the program. For general pest control guidance see Attachment A, Facility Pest Control Guide.

1. *Identifying pests*. Identifying the diseases, insects, or weeds that occur with a frequency and magnitude that qualifies them as pests.
2. *Defining the ecosystem.* Setting the boundaries of the areas to be treated, such as separate buildings or landscaped areas. Determining the lifecycle and ecological interaction of the pests and the resource to be protected.
3. *Creating a monitoring system*. Dividing the ecosystem into smaller areas as required to facilitate regular inspection for pest populations and activities. Training all facility personnel in the basics of IPM and the need for all employees to promptly report pest sightings.
4. *Establishing injury and action threshold levels*. Determining the threshold levels throughout the facility and grounds at which the severity of pest damage becomes more costly than the implementation of a pest management program. This action is facility-specific in that action levels can vary widely dependent on the size of the facility and numbers or types of pest problems.
5. *Developing treatment options*. Considering habitat modifications, structural modifications, physical controls, improved sanitation and housekeeping, use of pest-specific bait boxes or traps, or introduction of natural pest enemies as options. Using chemical pesticides as a last resort.
6. *Evaluating the program*. Evaluating the successes or failures of each treatment method applied. Getting feedback from employees about the pest control program.

RESPONSIBILITIES

General

The Postal Service is responsible for complying with FIFRA and providing a cost effective and environmentally sound pest management program. Although duties may be delegated, responsibility ultimately rests with Postal Service facility managers. Facility managers at all echelons of service must be familiar with the federal, state, and local regulations regarding pest control and the application of pesticides. Facility managers are responsible for compliance with the applicable regulations and must be able to identify pest control problems related to structural defects, lack of adequate sanitation, maintenance, housekeeping, or application of integrated pest control techniques.

Headquarters

Environmental Management Policy and Facilities Environmental (EMP and FE) offices are responsible for the coordinated development of

policies, plans, and programs for implementation of the Postal Service IPM program. EMP and FE organizations also are responsible for development of the IPM program to ensure compliance with the FIFRA and all other federal environmental laws and regulations that may affect the management of the IPM program at Postal Service facilities. The program must include the development of an IPM education element to provide necessary information concerning current pest control service and management techniques to all levels of Postal Service employees. A central IPM database may be established to monitor the IPM program across all Postal Service regions and provide information concerning best technology pest control techniques for common pest infestations as well as unique regionally-based pest control problems.

Other headquarters elements, such as Safety and Risk Management and Contract Services, must integrate IPM planning concepts into their strategic planning efforts. All other headquarters organizations must manage their functional areas to ensure compliance with the purpose and policy of this MI.

Areas

Area environmental compliance coordinators (AECCs) must encourage management participation and compliance with the IPM program at all levels of the field organization. The AECCs are responsible for IPM program deployment, reporting to headquarters and field units on the status of the IPM program and monitoring all facility, service, and budget activities related to pest control and program management within their service areas. Audits of the IPM program status at facilities within their service areas should include review of Pest Control Plans to ensure that proper records are maintained, appropriate pest control procedures are utilized, the facility's IPM program is effective, and contracted services for pest control are cost-effective and environmentally sound.

Facilities Service Offices

Environmental specialists (ESs) are responsible for technical support of IPM programs in all Postal Service facilities under their jurisdiction.

Districts

Environmental coordinators (ECs) are responsible for the deployment of coordinated IPM programs, as required, in all Postal Service facilities within their districts. They should monitor and report on all aspects of the IPM programs established in their districts and submit annual IPM status reports to their respective AECCs.

Facilities

Postal Service facility managers are responsible for implementating and operating the IPM program, providing employee training concerning the IPM program, and identifying their IPM program requirements. Facility managers may designate personnel to conduct the onsite training,

record keeping, reporting, and monitoring requirements pertaining to IPM contracted pest control services. Facility managers should document the conduct of the facility's IPM program and report IPM program status to the next higher level of Postal Service authority as required.

Inspection and Control Techniques

Inspection Report Forms and Logbooks. Most pest problems in a building are discovered and reported by tenants. A log of these specific requests for service should be picked up by the pest control technician upon arrival at the building and given first priority. It is recommended that a standardized Pest Control Work and Inspection Report or logbook be used as the basic record of pest control service.

Space Sprays. Facility or contractor personnel must understand that tenant requests for spraying of general areas cannot be honored in most cases. However, a space spray or fogging with a pyrethroid-based insecticide is occasionally necessary to control invading mites or large numbers of flying insects that are severely disrupting operations. During a space spray treatment, rooms should be unoccupied, all electronic equipment should be well covered, and the space should be ventilated for at least several hours before reoccupation. If possible, space spray work should be performed after normal working hours.

General Inspection Principles. Facility or contractor inspection of specific areas where pests have been reported should try to answer three questions about the problem:

1. Where exactly are the pests living, and can these sites be physically altered, removed, or treated with chemicals or traps?
2. How are the pests getting in, and can this access be reduced or eliminated?
3. What are the pests feeding on, and can this food source be reduced or eliminated?

Common Problems and Techniques

The following paragraphs describe the 10 most common pest problems of federal office buildings and techniques for dealing with them. These are intended as general guidelines, not as precise specifications. Special circumstances may arise that require alternate or modified approaches. An entomologist or certified pest controller should be consulted for additional information.

Rats

Rats dig burrows in planting beds and are attracted to piled debris and food remains in unsecured waste storage containers. Rat problems originate outside the building. These rodents usually stay at ground level and below, but if they gain access to wall voids, they may climb to upper floors. Rat control starts with three principal operations that do not involve the pest controller. Sanitation, housekeeping, and structural maintenance generally are important than trapping and poisoning in a rat control program.

1. **Garbage and Trash**. Since even office trash contains food remains that are attractive to rats, all collected waste must be stored for pickup in ratproof containers or kept in a ratproof room. *Ratproof* means no gaps greater than

one-half inch and material that cannot be easily gnawed. Compactors should be of a self-contained design and equipped with protective doors that close tightly over the charge box. This enclosed hopper is termed a ”doghouse” by the waste management industry.

2. **Storage and Debris**. Building grounds, loading docks, and interior space at street level and below should be kept as free as possible of piled materials that rats can use as shelter. Anything soft, such as rolled carpeting, insulation, or padded furniture, is particularly attractive to rats.

3. **Rat Access Into Buildings**. Rats commonly enter buildings under doors with greater than one-half inch clearance and through open doors and windows, holes gnawed through the weatherstripping of rolling doors, unscreened vents, holes where utilities enter the building, and cracks in masonry.

4. **Bait Boxes**. Rodenticide baits are normally effective only if there is little alternative food for the rats. Although pest control contractors often place bait boxes around building exteriors, their use on federal property is not recommended unless other control measures have failed or are impractical. All bait boxes on federal property should strictly conform to the following EPA guidelines:

   - Box anchored in place so that it cannot be picked up.
   - Box lid secured with some sort of fastener or locking tie.
   - Box of a tamper-resistant design, with a protected feeding chamber and constructed of a sturdy material.
   - Bait placed only in the feeding chamber, not inserted into the runway through the entrance hole.
   - Box label with name of rodenticide and last date of service.

5. **Tracking Powder**. Tracking powder applied deeply into burrows with a hand operated duster is one of the most effective ways of poisoning rats reluctant to accept bait. Treatment will be most effective in dry weather.

6. **Traps**. Snap traps and large glue boards, the recommended tools for killing rats indoors, may be used outdoors in protected locations. Great care must be taken to place traps out of the public view and to check them regularly.

Mice

Mice may enter a building from the outside, but most mouse problems originate indoors. Although large numbers can build up in food service areas of trash rooms, small numbers can survive practically anywhere. Mice frequently spread through a structure along pipes, cables, and ducts. The increased use of raised flooring for electric cables in telecommunications and computer facilities has greatly increased potential mouse harborage in public and commercial buildings.

1. **Entry Points**. Blocking mouse access routes into occupied space by sealing up where utilities enter is a practical control measure for limited areas. Caulk, copper mesh, steel wool, or polyurethane aerosol foam will stop mouse entry in most cases. However, young mice can squeeze through cracks just wider than one-quarter inch. Large, open office areas or rooms in older buildings may have so many potential access points that sealing is impractical.

2. **Cleaning and Housekeeping**. Sanitation for mouse control is similar to that required for cockroaches. All food and garbage should be stored in sealed containers, surfaces and crevices should have no food residue, and

piled materials should be eliminated as much as possible. Strict attention to cleanliness is essential for mouse control in food service areas. However, it is often difficult to achieve a level of office sanitation that actually makes a difference for a scattered, low-level mouse infestation.

3. **Rodenticide**. Rodenticide bait or tracking powder generally is not recommended for mouse control inside buildings because of the potential odor problems of poisoned mice that have died behind walls. In addition, there is always the chance that tracking powder applied even to inaccessible locations will be disturbed during future renovation work.

4. **Traps**. Glue boards and snap traps are usually the most effective ways to control small numbers of mice. Extreme care must be taken to conceal traps in order to avoid adverse occupant reaction. Windup, multiple-catch traps can be useful in kitchens or unoccupied spaces with dense infestations, provided the necessary sanitation and sealing measures also are carried out.

Small Cockroaches

Two types of small cockroaches, the German and the brown-banded, are responsible for most pest complaints and pesticide use in public and commercial buildings. Although it is widely believed that these insects can never be eradicated from the workplace, it is possible to totally eliminate them from a limited area such as an office. However, the degree of success depends not only on insecticides, but on occupant attention to detail in cleanliness and housekeeping. Roaches and their egg capsules are continually reintroduced into most types of space, hidden inside room dividers and other furniture, on custodial trash carts, and with packaged food. These invaders will not automatically survive and multiply if they cannot find enough to eat.

1. **Sanitation**. Cleaning up to reduce cockroaches in an office environment must focus mainly on the food residue in and around coffee machines, microwaves, refrigerators, trash cans used for food disposal, and desks and cabinets where exposed food is stored. Occupants concerned about cockroaches in their workplace must understand their own responsibility for storing all food in tightly sealed containers and for cleaning surfaces on which food is prepared or consumed. Daily afternoon trash pickup is recommended. Even better is a dedicated container in each office, with a tight lid and a plastic liner that is changed with every pickup, for disposal of all items containing food residue. Regular steam cleaning or pressure washing of all possible structural crevices and equipment is probably the most effective cockroach control technique for food service areas and trash rooms.

2. **Caulking**. Eliminating the cracks where cockroaches live and where they enter a room from behind walls is an excellent way to reduce their numbers on a long-term basis. In fact, a caulking gun is probably the most appropriate symbol of modern pest control. Care must be taken to seal the entire crevice so that roach access is totally eliminated. Types of space where caulk or grout are most effective include food service areas, restrooms, and janitors' closets. The most common types of cracks to eliminate include those where sinks and fixtures are mounted to the wall or floor, those around all types of plumbing, those on baseboard molding and corner guards, those where shelves and cabinets meet walls, and those on or near food storage and preparation surfaces.

3. **Baits**. Containerized and paste or gel baits should be the standard insecticide treatments for cockroaches in most types of occupied spaces.

The small, plastic bait containers should be placed as close as possible to the dark, concealed spots where roaches actually live, and preferably located along edges and in corners. The most common mistakes in using containerized bait are not eliminating nearby alternate food, and not using enough containers. For example, at least two to three should be placed in desks with roach problems. As a general rule, containers should be replaced after 3 months. However, replacement may have to be much more frequent at the beginning of a baiting program if cockroaches are very numerous. Paste and gel baits are most effective when applied in many small dabs, preferably with a syringe-like dispensing tool. Abamectin dust is another type of bait that is safe and highly effective, but it must be carefully injected only into crevices.

4. **Crack and Crevice Spraying**. Spraying is sometimes the most practical and effective way to apply pesticides in food service areas, restrooms, and trash rooms. Spray must be precisely applied in small amounts only to cracks and crevices. The preferred way to accomplish this is by an aerosol can either directly fitted with a long, narrow injection wand, or connected to the wand by a coiled delivery tube with an application valve. A crack and crevice treatment implies that the stream of insecticide is never visible during the spraying process.
5. **Sticky Traps**. Many types of cardboard or plastic sticky traps are available to help the pest control technician or facility personnel pinpoint sources of cockroach infestation or monitor areas where occupants have complained but no infestations can be visually detected. Sticky traps are not intended tocontrol, but rather to guide and evaluate control efforts as part of the inspection process.

Large Cockroaches

Several types of cockroaches grow to over an inch and a half in length and are commonly called waterbugs in many localities and palmetto bugs in Florida. Although these huge insects may wander along pipes throughout a building, they live mainly at ground level or below in most parts of the country. Treatment should focus on warm, moist areas such as basements, boiler rooms, pipe chases, sumps, and elevator or sewer shafts. In southern states, even attics and mulched outdoor planting beds may be infested with large cockroaches.

1. **Drying**. Reducing moisture, such as by fixing leaks, improving drainage, and installing screened vents to increase airflow, is one of the most effective ways to control large cockroaches in buildings.
2. **Sealing Entry Points**. Applying caulk or grout around restroom fixtures and other plumbing will block many cockroach access routes from wall voids into occupied space. Basement floor drains should be fitted with screens or basket inserts.
3. **Housekeeping**. In addition to eliminating food residue, reducing clutter is critical for large cockroach control. Piled boxes and cartons, rolled carpeting, and any stored paper or cardboard materials are favorite hiding places, particularly in dark, damp locations.
4. **Baits**. As with the small cockroaches, pesticide control should emphasize the use of baits rather than sprays. However, different products are usually more effective for large roaches, particularly in non-occupied space. An entomologist or certified pest controller should be consulted for current recommendations.

Ants

Most types of ants that are indoor pests come from nests located outside the building or inside its wall voids. The most effective control typically

entails sealing up cracks (usually around windows and other locations on exterior walls) where the ants are entering. Close observation on the outside often can help pinpoint these access crevices. Vegetation in contact with the building exterior, such as tree limbs or climbing ivy, should be removed. Containerized bait is usually the most effective type of pesticide treatment on a short term basis, although, if possible, the nest should be located and destroyed with pesticide injection. Four types of ant problems require special responses:

1. **Pharaoh Ants**. Pharaoh ants are very small yellowish-brown to reddish-brown ants that can nest in almost any hollow place inside a building. In an office, for example, these ants could be coming from inside a table leg or room divider, behind a baseboard or switch plate, above the ceiling, or under the floor. In southern states, colonies may be located outside. It is important that sprays not be used for control attempts, since these usually only stress the colony, which often responds by dividing. If spray is continually applied, this "budding" process results in many widely scattered colonies that infest a far greater area than before. An entomologist or certified pest controller should be consulted for current recommendations on bait.
2. **Fire Ants**. In southern states, fire ants can be a stinging hazard on building grounds and can become indoor pests as well. Use of pesticides for fire ant control is usually unavoidable. Treatment often combines pressurized injection of spray into individual mounds with use of bait formulations over broader areas. An entomologist or certified pest controller should be consulted for current recommendations.
3. **Carpenter Ants**. Carpenter ants are large ants that tunnel in wood. Small numbers in a building may simply be invaders from an outdoor nest that can be controlled by sealing up their point of entry. Large numbers inside typically indicate a nest within the building. Carpenter ants generally prefer wood that is moist and are considered to be an early warning signal of structural leaks or drainage problems. Control consists of locating the nest, injecting pesticide directly into it, replacing the damaged wood, and eliminating or reducing any source of moisture.
4. **Ant Swarming**. Many types of ants produce winged queens and males at certain times of the year. Large numbers of these swarmers may pour out of crevices into a room, even in locations that never had a problem with crawling ants. Swarming ants can severely disrupt operations, and often result in occupant demands for spraying. In cases where the ants are relatively concentrated (such as at windows), the recommended procedure is to vacuum them up and dispose of the contents in an outdoor trash receptacle. However, in some cases, a space spray with a pyrethroid-based insecticide may be the only practical response. Winged ants emerging inside a building usually die or disperse quickly, so spraying tends to be of little value if not done immediately. Rooms should be unoccupied during a space spray treatment, all electronic equipment should be well covered, and the space should be ventilated for at least several hours before reoccupation. Location of the ants' entry points and the nest itself, if possible, injection of pesticide into these crevices, and sealing up afterwards, is the standard procedure to prevent future swarming.

Fruit Flies

These tiny flies are introduced into buildings many times a day during warm weather, usually as nearly invisible immatures (eggs, larvae, pupae) on fruit. Since large numbers of these immatures can develop into adult flies within several days, and since one female fruit fly then can

lay several hundred eggs, infestations build up rapidly when sanitation is not rigorous. Adult flies are easily dispersed throughout a structure by the air handling system and by hitchhiking on trash pickup carts. Although fruit flies are totally harmless and cannot bite, they are considered to be an intolerable nuisance by many people.

1. **Sanitation**. Eliminating the breeding sources for fruit flies is essential for controlling them, but locating these sources is often difficult. Fruit fly larvae require some sort of moist, fermenting material in which to develop. Typical sites that generate large numbers of flies include trash rooms and trash pickup carts, can and bottle recycling areas, and any space where food is routinely prepared, dispensed, and consumed. However, there may be dozens of smaller, local sources that contribute to the problem throughout a building. These include leaks under refrigerators, dirty mops, clogged drains, or peels and rinds left in trash receptacles.
2. **Traps**. A fruit fly problem can be greatly reduced by the use of traps. There are many different trap designs, but all work by using bait to attract the flies into a container. Two of the most effective baits are ripe banana and vinegar. Some traps lure the flies through a funnel of similar one-way openings, while others rely on the collected flies eventually drowning in a liquid bait. Homemade traps can be easily fashioned from mason jars fitted with paper funnels, but several inexpensive plastic models are commercially available. Traps are remarkably effective, but problems can arise when either too few are deployed or servicing (removing flies and renewing bait) is too infrequent. An increasing number of pest control contractors are using traps as part of their normal service for fruit fly infestations.
3. **Space Sprays**. Space sprays are not recommended for fruit fly control since the potential for adverse occupant reaction to the pesticide usually exceeds any short-term benefit. However, in cases where large numbers of flies are severely disrupting operations, a space spray with a pyrethroid-based insecticide may be the only practical response. Rooms should be unoccupied during the treatment, all electronic equipment should be well covered, and the space should be ventilated for at least several hours before reoccupation. If the breeding source of the flies is not discovered and corrected, sprays will only give temporary relief.

Spiders and Miscellaneous Crawling Pests

Although fear of spiders is common, poisonous types are not likely to be encountered in most public or commercial buildings. Harmless, crawling spiders are occasionally a nuisance in basements or warehouses. Tighter sealing around windows and utility access holes, and tight weatherstripping on exterior doors will usually reduce their numbers. Residual insecticide sprayed on surfaces near potential entry points tends to be relatively ineffective, although microencapsulated formulations may have greater chance for success. Spiders that build webs in secluded corners or in outdoor locations such as eaves, lights, or cooling towers, can be most efficiently controlled with a vacuum. The general approach of sealing up entry points and vacuuming up intruders should be the first consideration for most types of crawling pests, such as crickets, millipedes, and scorpions.

Termites

Most people are familiar with the extensive destruction that termites can cause to wooden structures. Termites can also damage structural wood in steel and concrete buildings, such as trim or molding, panelling,

furring strips, or door and window frames. Stored files, stacked books, ar any other cellulose-based material such as fiberboard sheathing or insulation panels may also be attacked. Most termite problems in large offices buildings involve subterranean colonies that persist for years on buried scrap wood and constantly explore upwards for new sources of food. These colonies are often a nuisance not because of the actual damage they cause, but because of the periodic emergence of large numbers of winged swarmers that find their way into occupied space. Although extremely disruptive, swarmers are harmless, cannot bite or carry disease, and cannot damage interior wood. Swarming termites should be controlled with a vacuum rather than a space spray, but spraying may be unavoidable in rare circumstances. All comments in paragraph 5d, Ant Swarming, apply to swarming termites.

1. **Spot Injection and Sealing**. In masonry buildings with minor termite damage or localized swarming, satisfactory control can often be accomplished with pressurized injection of insecticide directly into the wood, or into the crevices from which the swarmers are emerging. If possible, the crevices should then be caulked or otherwise sealed.

2. **Drilling, Trenching, Fumigation**. Subterranean termite problems that cannot be solved with spot injection and sealing must be treated with far more extensive insecticide application. Standard techniques involve pumping the chemical into holes drilled through the building's slab and/or into the soil around the building's foundation. In the southern states, severe infestations of certain types of termites that live in dry wood above ground (including furniture) may have to be controlled with fumigation. These types of termite treatments require specialized contractor expertise and are beyond the scope of normal pest control. Consult an entomologist or certified pest controller for additional information.

Birds

Although the general public tends to be very fond of them, birds can be serious pests when they roost and nest on buildings. Their acidic excrement is unsightly, harbors microorganisms that can cause severe illness, and corrodes virtually any structural material. Their nests are unpleasant additions to most structures, and they can block air intakes, damage the building surface by holding water against it, and contain parasites that can become indoor pests. Bird control is a difficult and highly specialized subject and is best obtained through a specialized contract. Similarly. several important precautions must be taken when cleaning bird excrement that do not apply for standard custodial work. An entomologist or a certified pest controller with experience in bird control problems should be consulted for additional information.

1. **Concerns of Structural Bird Control**. Three primary requirements must be met by a bird control program:

   - Maximal Effectiveness. In addition to providing long-term protection against pest birds, cost effectiveness over time also must be considered. Utility and appearance of some systems deteriorate more rapidly than others. Durability and the need for repair also tend to vary with the exterior maintenance requirements of different buildings.

   - Minimal Damage to Structure**.** Of particular importance for historic buildings, permanent physical and esthetic damage to any structure

should be avoided in bird control work. Avoidance of damage consists of three criteria: the system used must be harmless to building materials and finishes; it must be reversible so that if it is eventually removed the building can be returned to its original state; and it must be inconspicuous, so that it is not noticeable to passers-by.

- Attention to Public Relations**.** Since even the perception that birds are being harmed is likely to draw considerable criticism from individual citizens, special interest groups, and the media, bird control efforts should always be as humane and as discreet as possible.

2. **Traditional Control Methods**. Several bird control methods have been in widespread use for many years. Although they may be appropriate in restricted or specialized circumstances, they are not recommended for large-scale projects, historic strictures, or any high-visibility sites.

   - Toxic Baiting and Toxic Perches**.** Control by avicides (bird poisons), either added to feed or incorporated into special perches, has the same basic drawback as controlling insects with poisons - there are always more birds to take the place of those killed. Since there is a high risk that dead and dying birds will result in adverse public reaction, avicides are undesirable for most situations.

   - Porcupine Wire**.** Several anti-roosting products consisting of wire spikes or coils stick up from ledges to prevent birds from landing. Although usually effective against pigeons if precisely installed, these strips of porcupine wire are unacceptable in appearance for sites in the public view. Their attachment to historic structures also produces an unacceptable risk of damage to the masonry. Furthermore, smaller birds such as sparrows often use the wire as convenient anchoring points for their nests, adding to its unpleasant appearance. Porcupine wire is most for relatively concealed applications on utilitarian structures, such as overhead pipes and beams in garages.

   - Repellent Gels**.** Sticky gels that birds find unpleasant can be applied to ledges with caulking guns. These gels are not recommended in most circumstances due to their eventual discoloration by dust and other air pollution, potential staining or even spalling of the underlying masonry, mess that often accompanies application, and temporary effectiveness.

   - Electrical Wire**.** The principle drawback of shock wire systems is that they are prone to shorting out because of water or ice, airborne debris, or maintenance work on a building's exterior. Since these systems are typically zoned for large areas of a structure, a single break or short can disable hundreds of feet of wire. Like the spikes of porcupine wire, the insulators of electric systems are conspicuous and often aesthetically displeasing . Unless strictly confined to mortar joints, with no damage to adjacent masonry, their installation would be automatically prohibited on historic structures.

   - Scaring Devices. Plastic owls and snakes, balloons with eye patterns, brightly-colored objects that turn in the wind, and dozens of other scarecrow variations are intended mainly for temporary protection of crops and are almost always ineffective for buildings. One specialized exception are the falcon or owl silhouettes that are successfully used to warn migrating birds from flying into large windows and glass doors.

   - Screening**.** Barriers and cages of hardware cloth or other wire screen are often the most efficient way to keep birds off and out of limited areas of

utilitarian structures that are not in the public view. A 3/4 inch mesh is the largest size that will eliminate sparrows and starlings.

3. **Tensioned Netting and Pin and Wire**. Two relatively new types of systems are the recommended solutions for birdproofing on a large scale, on historic structures, or on any high-visibility site. Pin and wire installations consist of spring-tensioned stainless steel wires strung at different heights along projecting elements such as ledges, lintels, sills, and string courses. The wires are attached to slender stainless steel pins inserted into mortar joints. Tensioned netting installations consist of various types of net fabrics stretched taut across recessed elements such as niches, colonnades, and the coffered ceilings of porticos. Wires or cables threaded through the net edges provide an even tension that can be adjusted by turnbuckles. The cables run through hooks or screw eyes that are attached to the building only at mortar joints. When correctly installed, both of these systems are effective, durable, and inconspicuous.

4. **Cleaning Bird Excrement**. Bird droppings often contain microorganisms that can cause serious illness. However, infection typically occurs by inhaling these pathogens through the nose and mouth. Therefore, bird excrement is dangerous mainly when it is dry and subject to becoming airborne as a fine dust, particularly when disturbed by sweeping or scraping. Although a germicide is sometimes applied to accumulated excrement prior to cleaning, thoroughly saturating the excrement with water and using appropriate respirators is usually sufficient for protection of workers. Additionally, many disinfectants are oil-based formulations that may permanently stain building materials. If possible, cleaning efforts should be coordinated with the installation of modern birdproofing systems and the removal of any old, ineffective control systems. The following six items should be included in specifications for removal of bird excrement on building exteriors:

   - Breathing Protection**.** All personnel working with accumulated bird excrement should wear a National Institute for Occupational Safety and Health (NIOSH) approved full-face piece respirator with a high efficiency particulate air (HEPA) filters for screening particles of 0.3 micron or larger size. Dust and particulate masks are better than nothing, but they do not provide effective respiratory protection for workers. Respirators must be used in accordance with OSHA regulation 29 CFR 1910.134. A full respiratory protection program must be initiated when workers are required to wear respirators. This program includes fit-testing of respirators, maintenance, training, storage, plus initial pre-placement and periodic medical surveillance examinations.

   - Protective Clothing**.** All personnel should wear protective coveralls, gloves, boots, and safety headgear.

   - Application of Water**.** All excrement should be saturated with water to prevent the debris from becoming airborne. If hoses are used to remove excrement from the exterior of buildings, they should be low pressure devices only. Hand-held compressed air sprayers filled with water are also satisfactory and result in lower amounts of runoff. Higher pressure devices should be used for hosing small amounts of excrement off of sidewalks and pavement.

   - Non-metallic Tools**.** On historic structures, only non-metallic tools such as plastic spatulas and natural fiber/nylon bristle brushes should be used to remove excrement. Tools that can easily damage building surfaces, such as coarse wire brushes, should not be used.

- Disposal**.** Removed excrement should be collected in plastic bags, sealed, and disposed of at a sanitary landfill.
- Public Protection**.** Excrement removal on public buildings should not be performed during normal working hours. If possible, the work should be scheduled for weekends. Barricades and signage should be used to keep the public clear of the work site during removal operations.

Paper Mites

Pinprick-like biting sensations, usually on exposed skin and often producing inflammations that resemble insect bites, can be a persistent problem in some facilities. Occupants tend to blame these bites on some sort of pest infestation, typically fleas (which are extremely rare in office buildings) or paper mites that do not exist!). Demands for spraying of the affected space are often carried out by pest controllers in the absence of any evidence that insects are responsible for the problem. In fact, paper mites are almost always tiny, irritating particles that constitute a sanitation and indoor air pollution problem rather than a pest control problem.

1. **The Role of Management**. The most common mistake of managers in paper mite situations is to automatically request a pesticide treatment. The second most common mistake is for management to dismiss complaints of biting as being fabrications. Although there are cases where people imagine they are being attacked by unseen parasites, most instances of biting-like sensations in offices involve a genuine source of skin irritation. The circumstances can be further complicated since many health care professionals are unfamiliar with the paper mite syndrome and frequently misdiagnose resulting welts as insect bites. Other misinformed people may believe that microscopic dust mites are the cause: these are real organisms but generally cause respiratory distress rather that bites. It is also normal for co-workers of a person who complains of paper mites to develop a heightened sensitivity to skin irritations through the power of suggestion. Management must treat all concerned with respect but must emphasize that no pesticide treatment will be authorized without confirmation that a pest problem exists.
2. **Inspection for Parasites**. An inspection of the affected area must be carried out by a pest control professional who understands the paper mite syndrome. Usually when real parasites are present, they are abundant and readily seen. The most common types of parasites involved are mites that come from bird nests or from concealed infestations of rodents. Occasionally fleas living on guard or seeing-eye dogs will bite people who work in the vicinity. If a thorough inspection fails to produce any specimens, a non-pest cause is probably responsible for the problem. It is standard procedure to place sticky traps (discussed in the cockroach section) throughout the area for monitoring purposes. Occupants should be instructed to capture anything they suspect is biting them on a piece of clear tape. A single identified parasite may justify treatment. However, the captured items are typically bits of debris or tiny harmless insects present in buildings as a result of inadequately filtered air intakes.
3. **Inspection for Airborne Particles**. Only rarely are the real culprits in paper mite cases positively identified, although there are often strong suspects. Shards of fiberglass from batting above drop ceilings, particles from both newly installed as well as worn carpets and carpet pads, and paper dust from separating forms and computer printouts along tear lines are some of the most common proven causes of the pinprick-like irritations. The dry air

of many workplaces not only makes skin more sensitive to these tiny particles; it also increases static electric fields that are the primary causes of the particles seeming to jump onto employees' exposed skin. Any activity which stirs up accumulated dust, such as office renovations or purging old files, often leads to a paper mite outbreak. In cases where there is no obvious explanation, or multiple factors may be involved, the services of a certified industrial hygienist should be used to determine the causative agents.

4. **Remedial Actions**. It is not unusual for pesticide spraying or fogging to bring temporary relief to employees experiencing a paper mite problem. While part of the reason is psychological, the main reason is that the spray acts to decrease static charges in the area and allow particles to settle out of room air. It is unethical and generally illegal for pesticides to be used in this manner. The same effect can be accomplished by frequent damp cleaning, including washing carpets with only water, while efforts are made to identify and eliminate the source(s) of irritation. Vacuum cleaning is not recommended in these cases unless the vacuums are equipped with HEPA filters. Without these filters it is not unusual for more dust to become airborne due to the vacuuming operation. The use of humidifiers or air purifiers is of benefit if the affected space is not too large. It may be advisable for affected employees to seek the advice of a dematologist since simple skin treatments such as the use of moisturizers and the avoidance of harsh soaps are often used to minimize normal skin irritation problems.