



## Step 6: Applying IPM Strategies

Pest-prevention measures can be incorporated into existing structures. Such preventive measures reduce the need for pesticide applications and include sanitation and structural repair, employing physical and mechanical controls such as screens, traps, weeders, air doors, etc. Specific IPM strategies for specific school sites are provided below. (Note: Every school will experience slightly different combinations of pests.)

### IPM Strategies for Indoor Sites

#### Typical Pests:

*Mice, rats, cockroaches, ants, flies, wasps, hornets, yellow jackets, spiders, microorganisms, termites, carpenter ants, and other wood-destroying insects. Although beneficial as predators, wasps, hornets, yellow jackets, and spiders can be troublesome.*

#### Entryways:

(door-ways, overhead doors, windows, holes in exterior walls, openings around pipes, electrical fixtures, or ducts):

- ?? Keep doors shut when not in use.
- ?? Place weather stripping on doors.
- ?? Caulk and seal openings in walls.
- ?? Install or repair screens.
- ?? Install air curtains.
- ?? Keep vegetation, shrubs, and wood mulch at least 1 foot away from structures.

#### Classrooms and Offices

(classrooms, laboratories, administrative offices, auditoriums, gymnasiums, and hallways):

- ?? Allow food and beverages only in designated areas.
- ?? If indoor plants are present, keep them healthy. When small insect infestations appear, remove them manually.
- ?? Keep areas as dry as possible by removing standing water and water damaged or wet materials
- ?? In the science lab, store animal foods in tightly sealed

containers and regularly clean cages. In all areas, remove dust and debris.

- ?? Routinely clean lockers and desks.
- ?? Frequently vacuum carpeted areas.
- ?? If students get head lice, consult with your local health department and have their parents contact a physician. Discourage students from exchanging hats or caps at school.

### **Food Preparation and Serving Areas**

(dining room, main kitchen, teachers' lounge, home economics kitchen, snack area, vending machines, and food storage rooms):

- ?? Store food and waste in containers that are inaccessible to pests. Containers must have tight lids and be made of plastic, glass, or metal. Waste should be removed at the end of each day.
- ?? Place screens on vents, windows, and floordrains to prevent cockroaches and other pests from using unscreened ducts or vents as pathways.
- ?? Create inhospitable living conditions for pests by reducing availability of food and water--remove food debris, sweep up all crumbs, fix dripping faucets and leaks, and dry out wet areas.
- ?? Improve cleaning practices, including promptly cleaning food preparation equipment after use and removing grease accumulation from vents, ovens, and stoves. Use caulk or paint to seal cracks and crevices.
- ?? Capture rodents by using mechanical or glue traps. (Note: Place traps in areas inaccessible to children. Mechanical traps, including glueboards, used in rodent control must be checked daily. Dispose of killed or trapped rodents within 24 hours.)

### **Rooms and Areas With Extensive Plumbing**

(bathrooms, rooms with sinks, locker rooms, dishwasher rooms, home economics classrooms, science laboratories, swimming pools, and greenhouses):

- ?? Promptly repair leaks and correct other plumbing problems to deny pests access to water.
- ?? Routinely clean floor drains, strainers, and grates. Seal pipe chases.
- ?? Keep areas dry. Avoid conditions that allow formation of condensation. Areas that never dry out are conducive to molds and fungi. Increasing ventilation may be necessary.
- ?? Store paper products or cardboard boxes away from moist areas and direct contact with the floor or the walls. This practice also allows for ease in inspection.

## **Maintenance Areas**

(boiler room, mechanical room, janitorial-housekeeping areas, and pipechases):

- ?? After use, promptly clean mops and mop buckets; dry mop buckets and hang mops vertically on rack above floor drain.
- ?? Allow eating only in designated eating areas.
- ?? Clean trash cans regularly, use plastic liners in trash cans, and use secure lids.
- ?? Keep areas clean and as dry as possible, and remove debris.

## **IPM Strategies for Outdoor Sites**

### **Typical Pests:**

*Mice and rats. Turf pests--broad-leaf and grassy weeds, insects such as beetle grubs or sod webworms, diseases such as brown patch, and vertebrates such as moles. Ornamental plant pests--plant diseases, and insects such as thrips, aphids, Japanese beetles, and bag worms.*

### **Playgrounds, Parking Lots, Athletic Fields, Loading Docks, and Refuse Dumpsters:**

- ?? Regularly clean trash containers and gutters and remove all waste, especially food and paper debris.
- ?? Secure lids on trash containers.
- ?? Repair cracks in pavement and sidewalks.
- ?? Provide adequate drainage away from the structure and on the grounds.

### **Turf**

(lawns, athletic fields, and playgrounds):

- ?? Maintain healthy turf by selecting a mixture of turf types (certified seed, sod, or plugs) best adapted for the area. Check university or Cooperative Extension service for recommendations on turf types, management practices, or other information.
- ?? Raise mowing height for turf to enhance its competition with weeds; adjust cutting height of mower, depending on the grass type; sharpen mower blades; and vary mowing patterns to help reduce soil compaction.
- ?? Water turf infrequently but sufficiently during early morning hours to let turf dry out before nightfall; let soil dry slightly between waterings.
- ?? Provide good drainage, and periodically inspect turf for evidence of pests or diseases.
- ?? Allow grass clippings to remain in the turf (use a mulching

- mower or mow often) or compost with other organic material.
- ?? Have the soil tested to determine pH and fertilizer requirements.
- ?? Use a dethatcher to remove thatch. Do this in early fall or early spring when the lawns can recover and when overseeding operations are likely to be more successful.
- ?? Time fertilizer application appropriately, because excessive fertilizer can cause additional problems, including weed and disease outbreaks. Apply lime if necessary. Use aeration to place soil on top of thatch so that microbes from soil can decompose thatch.
- ?? Seed over existing turf in fall or early spring.
- ?? Obtain more information on turf from EPA's brochure entitled, [\*Healthy Lawn, Healthy Environment: Caring for Your Lawn in an Environmentally Friendly Way\*](#) (1.7 MB, [PDF](#) format).

### **Ornamental Shrubs and Trees:**

- ?? Apply fertilizer and nutrients to annuals and perennials during active growth and to shrubs and trees during dormant season or early in the growing season.
- ?? If using a fertilizer, use the correct one at the suitable time, water properly, and reduce compaction.
- ?? Prune branches to improve plants and prevent access by pests to structures.
- ?? Use the appropriate pest-resistant variety (check with your local Cooperative Extension Service), and properly prune for growth and structure.
- ?? Correctly identify the pest in question. When in doubt, send several specimens to your local Cooperative Extension Service. Once the pest is identified, recommendations can be made.
- ?? Use pheromone traps as a timesaving technique for determining the presence and activity periods of certain pest species. Pheromones are chemicals released by various organisms as means of communication with others of the same species, usually as an aid to mating.
- ?? Select replacement plant material from among the many disease-resistant types being developed by plant breeders throughout the country.
- ?? Check with your local State Cooperative Extension Service or university for information on plant types appropriate for your site.
- ?? Remove susceptible plants if a plant disease recurs and requires too many resources, such as time, energy, personnel, or money. Some ornamental plants, trees, and turf are so susceptible to plant diseases that efforts to keep them healthy may be futile.

### **Applying Pesticides Judiciously**

Many different kinds of pesticides are currently available for use against urban and structural pests. An appropriate application uses the least toxic and most effective and efficient technique and material. Due to their potentially toxic nature, these materials should be applied by qualified applicators in a manner to ensure maximum efficiency, with minimal hazard. Pesticides should be applied only when occupants are not present in areas where they may be exposed to materials applied.

Although EPA registers pesticides for use within the United States, the fact that a particular product is registered does not mean that it is "safe" under all conditions of use. All pesticides used in the U.S. must be EPA registered, and the registration number must be listed on the label. Read and follow the pesticide label directions, know how to apply and handle these chemicals, and try to minimize the exposure to children, adults, and other non-target species.

The following general recommendations should minimize exposure to people and other non-target species when the application of pesticides is being considered:

- ?? Read and follow all label instructions.
- ?? Choose a pesticide that is labeled for the specific site, intended for the pest you are trying to control, and as target specific as possible, rather than broad spectrum.
- ?? Use a spot-treatment method of application when pesticide treatments are required. Treat only the obviously infested plants in an area. This procedure helps conserve predators and parasites needed to reduce future pest populations and increases the time between pest outbreaks.
- ?? Limit the use of sprays, foggers, or volatile formulations. Instead use bait and crack and crevice application when possible. Look for crack and crevice label instructions on how to apply the pesticide. These treatments maximize the exposure of the pest to the pesticide while minimizing pesticide exposure for the occupants.
- ?? Place all rodenticides either in locations not accessible to children and non-target species or in tamper resistant bait boxes. Outdoors, place bait inside the entrance of an active rodent burrow, and then collapse the burrow entrance over the bait to prevent non-target species' access. Securely lock or fasten shut the lids of all bait boxes. Place bait in the baffle-protected feeding chamber of the box. Never place bait in the runway of the box.
- ?? Apply only when occupants are not present or in areas where they will not be exposed to the material applied. Note any re-entry time limits listed on the label, and be aware that some residues can remain long after application.
- ?? Use proper protective clothing or equipment when applying pesticides.
- ?? Properly ventilate areas after pesticide application.
- ?? Notify students, staff, and interested parents of upcoming pesticide applications if that is part of the school pest management policy. Pay particular attention to those individuals that may be at higher risk.
- ?? Keep copies of current pesticide labels, consumer information sheets, and

Material Safety Data Sheets (MSDS) easily accessible.

### **Storing Pesticides**

Store pesticides off site or in buildings that are locked and inaccessible to all undesignated personnel. Be sure adequate ventilation is provided for the pesticide storage area. Store herbicides separately to avoid potential damage to plants from the absorption of vapors onto other pesticides stored nearby. Avoid storing pesticides in places where flooding is possible or in open places where they might spill or leak into the environment. Store flammable liquids away from an ignition source. Check for state recommendations and requirements for pesticide storage.

If pesticides are stored in occupied buildings, take special care to ensure that the air in the occupied spaces does not get contaminated. Place a notice outside the designated storage area. Store all pesticides in their original containers, and secure lids tightly. Make sure that childproof caps are properly fastened. However, even closed pesticide containers may release toxic chemicals to the air through volatilization. Therefore, store pesticides only in spaces that are physically separated and closed off from occupied spaces and where there is adequate exhaust ventilation (i.e., the air is vented directly to the outside). In addition, precautions are needed to ensure that the air in the storage space has no chance of mixing with the air in the central ventilation system.

The pest manager is responsible for periodically checking stored pesticide containers for leaks or other hazards. To reduce pesticide storage problems, buy only enough of the pesticide product to last through the use season. Mix only the amount of pesticide needed for the immediate application.

### **Posting and Notification**

Local law may require schools to notify students and staff of impending pesticide applications. If not, the school system may take the responsibility of informing school staff and students' parents of upcoming pesticidal treatments. When good IPM practices are followed, concerns raised by notification and posting activities may be minimized. If notification and posting is a new practice at the school, the new policy should be explained so that it will not be misinterpreted to imply that more pesticides are being applied than previously. Notification can be accomplished by posting notices around the school and sending notices home to those parents who wish to be informed in advance of pesticide applications. Schools should consider posting notices in areas to be treated or that have been treated. The school pest manager should be prepared and be available to provide more specific information to concerned parents and others. A voluntary registry of individuals who could be adversely affected by exposure to pesticides can

be kept at the school health or administrative offices. Information on how to contact the local poison control center and emergency personnel should be kept readily accessible. The school may also wish to consider informing the adjacent community in advance of planned outdoor pesticide applications.

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## Step 7: Evaluating Results and Record Keeping

Successful practice of IPM relies on accurate record keeping. Record keeping allows the school to evaluate the results of practicing IPM to determine if pest management objectives have been met. Keeping accurate records also leads to better decision-making and more efficient procurement. Accurate records of inspecting, identifying, and monitoring activities show changes in the site environment (reduced availability of food, water, or shelter), physical changes (exclusion and repairs), pest population changes (increased or reduced numbers, older or younger pests), or changes in the amount of damage or loss.

A complete and accurate pest management log should be maintained for each property and kept in the office of the pest manager or property manager. Pesticide use records should also be maintained to meet any requirements of the state regulatory agency, School Board, and applicable local regulations. The log book should contain the following items:

- ?? A copy of the Pest Management Plan and service schedule for the property.
- ?? A copy of the current EPA-registered label and the current MSDS for each pesticide product used on school property.
- ?? Pest surveillance data sheets, which record, in a systematic fashion, the type and number of pests or other indicators of pest population levels revealed by the monitoring program for the site. Examples include date, number, location, and rodent species trapped or carcasses removed as well as date, number, and location of new rat burrows observed.
- ?? A diagram noting the location of pest activity, including the location of all traps, trapping devices, and bait stations in or around the site.

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