

Pesticides Pose Potential Risks in Schools

Your school community may be exposed to pests, as well as the pesticides used to control these pests. Pesticides can help control pests but they need to be used carefully. Children may be more sensitive to pesticides than adults. Young children, especially, may have different exposures than adults - - they can encounter pesticides by crawling, exploring, or hand-to-mouth activities.

Since children spend so much of their day at school, you have an opportunity to create a safer learning environment for them - to reduce their exposure to potentially harmful pests and to the pesticides used to control these pests.

The most important responsibility of the students and staff is sanitation. Much of the prevention and reduction of pest infestation at the school site depends on whether or not students and staff clean up food leftovers, food in lockers, gum under desks, paper clutter, etc., or perform proper maintenance. In addition, because people at the school site may observe the presence of pests, they should report any evidence of pest activity.

What is Integrated Pest Management?

IPM is an effective and environmentally sensitive approach to pest management that relies on a combination of commonsense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interactions with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment. IPM programs take advantage of all pest management options possibly including, but not limited to, the judicious use of pesticides.

Understanding pest needs is essential to implementing IPM effectively. Pests seek habitats that provide basic needs such as air, moisture, food, and shelter. Pest populations can be prevented or controlled by creating inhospitable environments, by removing some of the basic elements pests need to survive, or by simply blocking their access into buildings. Pests may also be managed by other methods such as traps, vacuums, or pesticides. An understanding of what pests need in order to survive is essential before action is taken.

Can Children's Exposure to Pesticides be Reduced in the School Environment?

IPM and Your School

The public's concerns about health and environmental risks associated with chemicals are increasing, particularly when children are involved. As the public becomes more aware of the health and environmental risks pesticides may pose,

its interest in seeking the use of equally effective alternative pest control methods increases. School administrators and other persons who have pest control decision-making responsibilities for school buildings and grounds should become aware of the pest control options available to them. It is in everyone's best interest to reduce exposure to potentially harmful chemicals.

The Environmental Protection Agency (EPA) has prepared this booklet to acquaint readers with Integrated Pest Management (IPM), a pest control method that may be an alternative to scheduled spraying of pesticides. Schools across the nation that have adopted such programs report successful, cost-effective conversion to IPM. IPM can reduce the use of chemicals and provide economical and effective pest suppression.

This information has been developed to **encourage** and assist school officials in examining and improving their pest management practices. It identifies ways to reduce dependence on pesticides in school buildings and landscapes and discusses alternative methods for managing pests commonly found in schools. School officials are not, however, required by law to adopt the practices recommended in this booklet.

Common Pests in School Settings

Your school may be providing food, water and shelter to pests. Some pests common in schools can harm both children and adults.

- Flies and cockroaches may spread disease.
- Cockroaches can cause allergies and asthma attacks.
- Yellow jacket stings are painful and can be life-threatening to those with allergies.
- Spiders may inflict painful bites and some may pose a health risk.
- Mice may contaminate food, trigger asthma attacks and cause structural damage.
- Termites cause structural damage.

Other pests may not pose an immediate health threat or damage to the structure, but are often controlled for aesthetic or other reasons.

- Weeds may invade playing fields or playgrounds.
- Head lice outbreaks may occur among students.
- Ants may swarm in hallways or classrooms.
- Fruit flies may gather in kitchens.

Strategies for Indoor Sites

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.

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.

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.