Integrated Pest Management (IPM) Policy

What is Integrated Pest Management (IPM)?

Integrated pest management (IPM) is an approach to pest control that utilizes regular monitoring and record keeping to determine if and when treatments are needed and employs a combination of strategies and tactics to keep pest numbers low enough to prevent unacceptable damage or annoyance. Biological, cultural, physical, mechanical, educational and chemical methods are used in site-specific combinations to solve the pest problem. Chemical controls are used only when needed and in the least-toxic formulation that is effective against the pest. Educational strategies are used to enhance pest prevention and to build support for the IPM program.

Although pesticides often play a role in IPM programs for schools, their use should be employed with caution. The risk of harm from exposure to pesticides is higher for infants and children than for adults exposed at the same levels. By using the least-toxic product effective against the pest and applying it as a spot treatment in combination with non-chemical methods such as pest-proofing and improved sanitation, risks from pesticide exposure can be minimized.

IPM Program Goal

The goal of the school IPM program is to protect human health by suppressing pests that cause diseases, to reduce losses from pest damage, reduce environmental pollution and to reduce human exposure to pesticides. In IPM programs, treatments are not made according to a fixed schedule; they are made only when and where monitoring has indicated the pest will cause unacceptable economic, aesthetic or medical injury or damage. In an IPM program, if treatments are needed, they are selected and timed to be most effective on the pest, least disruptive to its natural controls and least hazardous to humans and the environment.

IPM Program Components

One of the characteristics of an IPM approach that makes it so effective is that the basic decision-making process is the same for any pest problem in any location (See Fig. 1). The strategies and tactics may change, but the steps taken to decide if and when treatment is needed and which methods to use are the same each time. An IPM program is built around the following components:

- Monitoring the pest populations and other relevant factors
- Accurate identification of the pest
- Determining injury and action levels that trigger treatments

Figure 1: The Decision-Making Process
• Timing treatments to the best advantage
• Spot treating the pest (to minimize human and other non-target organism exposure to pesticides)
• Selecting least-disruptive tactics
• Evaluating the effectiveness of treatments to fine-tune future actions
• Educating all people involved with the pest problem

The Decision-Making Process: The If, Where, When and Which

IF treatment action is necessary. Instead of taking action at the first sign of a potential pest problem, the IPM process begins with asking whether any actions are needed by assessing the injury level (see the following section for injury and action levels). Certain pests may pose a greater potential threat in small numbers or may become threatening only in large numbers. By assessing the injury level on a pest-specific basis, further action plans can be made for the inclusion or exclusion of treatment protocols.

WHERE treatment activity should take place. If it is decided that some treatment action is necessary, it is important to thoroughly survey the area to determine the best place to treat in order to solve the problem. Treatment should be applied where actions will have the greatest effect.

WHEN action should take place. The timing of treatments is important and should be taken into consideration. Often there are optimal times during the pest’s life cycle when treatment would have the greatest effect. Conversely, there are also times when treatment could prove to be ineffective or even worsen the problem. The school system will also affect the treatment schedule, as it is important to plan ahead for pesticide use.

WHICH mix of strategies and tactics are the best to use. There are three guiding principles to use when choosing treatments: conserve and enhance naturally occurring biological controls; use a multitactic approach; and view each pest problem in its larger context.

Monitoring

Monitoring is the regular and ongoing inspection of areas where pest problems do or might occur. Information must always be documented and kept in an organized fashion. When monitoring, it is important to: 1) identify the target pest; 2) identify the time monitoring activities took place; and 3) keep accurate records.

Why monitor?
• Monitoring helps determine if treatment is needed
• Monitoring helps determine where, when and what kind of treatments are needed
• Monitoring allows you to evaluate and fine-tune treatments

What to monitor?
• The conditions of the building inside and out
• The level of sanitation inside and out
- The amount of pest damage and the number and location of pest signs
- Human behaviors that affect the pests
- Your management activities and their effects on the pest population

**Setting Injury and Action Levels**

Before any course of action can be determined, it is first important to determine the injury level. The injury level is the level of damage or the level of pest population that causes unacceptable injury. Once the injury level has been determined, an action level must be set. The injury level will always be higher than the action level, meaning that action should occur before the situation progresses the point of unacceptable injury (see Fig. 2). The action level is the level of pest damage or number of pests that triggers treatment to prevent pest numbers from reaching the injury level.

![Graph showing injury and action levels]

Aesthetic injury applies mainly to the damage of plants. This is injury that affects the appearance without affecting the health of the plant. There are few indoor pests or pests of structures that cause only aesthetic damage.

Economic injury refers to pest damage that causes monetary loss.

Medical injury relates to human health problems caused by pests.

**Figure 2: Injury and Action Levels**

**Criteria for Selecting Treatment Strategies**

Once the IPM decision-making process is in place and monitoring indicates that pest treatment is needed, the choice of specific strategies can be made. Choose strategies that are:
- Least hazardous to human health
- Least disruptive of natural controls in landscape situations
- Least toxic to nontarget organisms other than natural controls
- Most likely to be permanent and prevent recurrence of the pest problem
- Easiest to carry out safely and effectively
- Most cost effective in the short- and long-term
- Appropriate to the site and maintenance system
What are the Treatment Options?

*Education.* Education is a cost-effective pest management strategy. Information that will help change people’s behaviors, including proper disposal of waste and proper storage of food, will play a part in managing certain pests.

*Habitat modification.* Pests need food, water and shelter to survive. If the pest manager can eliminate or reduce the resources pests need to flourish, the environment will support fewer pests. Examples of habitat modification include: design or redesign of structures and landscape plantings; improved sanitation; eliminating water sources for pests; and eliminating the pest habitat.

*Physical controls.* Methods of physical control (or direct removal of pests from an environment) include vacuuming, trapping, erecting barriers, controlling the indoor climate and removing pests by hand.

*Biological controls.* A biological control uses a pest’s natural enemies to attack and control the pest. Biological control strategies include conservation (conserving the biological control application), augmentation (artificially increasing the number of biological controls in a given area) and importation (importing foreign controls).

*Least-toxic chemical controls.* Least-toxic pesticides are those with all or most of the following characteristics: they are effective against the target pest, have a low acute and chronic toxicity to mammals, biodegrade rapidly, kill a narrow range of target pests and have little or no impact on nontarget organisms. These include materials such as the following:

- Pheromones and other attractants
- Insect growth regulators
- Repellents
- Desiccating dusts
- Pesticidal soaps and oils
- Some botanical pesticides

The following criteria should be used when selecting a pesticide:

- Safety
- Species specificity
- Effectiveness
- Endurance
- Speed
- Repellency
- Cost

What is Pesticide Toxicity?

Pesticides are designed to control pests, but they can also be toxic (poisonous) to humans and pose a potential health threat. Pesticides harm humans when they enter the body, either orally (through the mouth), dermally (through the skin) or by inhalation (by breathing). These poisons work by altering normal body functions, causing either reversible or irreversible damage. There are two types of toxicity due to exposure to pesticides, which are acute (short-term exposure to
pesticides) and chronic (long-term exposure to pesticides). Acute toxicity is due to a single exposure and results in immediate appearance of symptoms, while chronic toxicity is due to multiple exposures with symptoms appearing between one week to several years.

**Which Pesticides are the Least Toxic?**

The term “least-toxic” refers to pesticides that have low or no acute or chronic toxicity to humans, affect a narrow range of species and are formulated to be applied in a manner that limits or eliminates exposure of humans and other nontarget organisms. Fortunately, there are an increasing number of pesticides that fit within this least-toxic definition. Examples include products formulated as baits, pastes or gels that do not volatilize in the air and that utilize very small amounts of the active ingredient pesticide and microbial pesticides formulated from fungi, bacteria or viruses that are toxic only to specific pest species but harmless to humans.

Least-toxic pesticides include:
- (a) Boric acid and disodium octobrate tetrahydrate
- (b) Silica gels
- (c) Diatomaceous earth
- (d) Nonvolatilize insect and rodent baits in tamper-resistant containers or for crack and crevice treatment only
- (e) Microbe-based pesticides
- (f) Pesticides made with essential oils (not including synthetic pyrethroids) without toxic synergists and
- (g) Materials for which the inert ingredients are nontoxic and disclosed.

The term least-toxic pesticides does not include a pesticide that is:
- (a) Determined by the U.S. EPA to be a possible, probable or known carcinogen, mutagen, teratogen, reproductive toxin, developmental neurotoxin, endocrine disruptor or immune system toxin
- (b) A pesticide in U.S. EPA’s toxicity category I or II
- (c) Any application of the pesticide using a broadcast spray, dust, tenting, fogging or baseboard spray application.

For toxicity categories and pesticide label statements, visit the U.S. EPA Web site at: [http://www.epa.gov/pesticides/health/tox_categories.htm](http://www.epa.gov/pesticides/health/tox_categories.htm)

**What are the Health Risks Associated with Pesticide Use and Children?**

Infants and children face higher risks from exposure to pesticides than adults at the same level. Children become exposed to pesticides when chemicals are released into the air or applied to surfaces they come in contact with. This usually involves the application of chemicals not considered to be least toxic, by way of spraying, fogging or bombing. Pesticide use has been linked to a number of chronic health problems including cancer, birth defects, endocrine disruption, immune system deficiencies, neurological disorders and asthma. There has been extensive research concerning the link between pesticides and cancer, particularly leukemia, brain cancer and soft tissue sarcomas. Acute health effects such as nausea, headaches and asthma attacks can also occur in both adults and children.
ADDITIONAL RESOURCES

Web resources

Sample School IPM Policy

Introduction
The {insert name of School District} recognizes that maintenance of a safe, clean and healthful environment for students and staff is essential to learning. It is the goal of the district to provide safe and effective, pest control while protecting students, staff, the environment and district properties and assets. The district adopts a least-hazardous integrated pest management (IPM) policy. It is the policy of the district to focus and develop long-term pest-prevention methods and give nonchemical methods first consideration when selecting appropriate control measures. The full range of alternatives will be considered, giving preference to nonchemical methods and then chemicals that pose the least hazard to people and the environment.

Pest management objectives
Pests will be controlled to protect the health and safety of the students and staff; to maintain a productive learning environment; and to maintain the integrity of the school buildings and grounds. Pest control will be economically feasible over the long term and efficacious. The superintendent or designee shall ensure the district follows IPM procedures so as to use the most appropriate and least-hazardous method of control. Sanitary measures shall be enforced and buildings regularly cleaned and repaired in order to prevent infestations, minimize the use of pesticides and eliminate routine spraying.

Elements of the Least-hazardous IPM Policy
- Identifying and monitoring pests to determine pest population levels and identify decisions and practices that could affect pest populations.
- Setting of action levels to determine when vegetation or a pest population at a specific site cause(s) unacceptable economic or medical damage wherein corrective action should be taken.
- Modifying and/or eliminating pest habitats to deter pest populations and minimize pest infestations.
- Considering use of a range of potential treatments for the pest problem including physical, horticultural and biological methods of pest control.
- Using chemical controls only as a last resort and only those chemicals that pose the least possible hazard to people and the environment.

IPM Coordinator
The superintendent shall designate {insert a staff person name or position} to coordinate the IPM program. The IPM coordinator shall be educated in the principles and practice of least-hazardous IPM and be responsible for:
- Oversight for the successful implementation of the program consistent with this policy and coordinate all district efforts to adopt IPM.
- Overall program management and providing proposed regulations or procedures and products for use in managing pest populations.
- Determining the action level that triggers treatment to prevent pest numbers from reaching the injury level.
- Posting warning signs for pesticide applications.
- Record keeping guidelines for any chemical pesticide application.
- Education and training for IPM personnel.
- Optional: A list of approved procedures and products.
Training
Training of personnel is critical to the success of an IPM program. Staff, students, pest managers and the public shall be educated about potential school pest problems, the IPM policy and procedures that will be used to achieve the desired pest management objectives.

Monitoring
Monitoring shall be regular and ongoing inspection of areas where pest problems do or might occur. The IPM coordinator shall document and keep this information in an organized fashion. Monitoring shall consist of identifying the target pest to help determine if treatment is needed along with where, when and what kind of treatments to be administered.

Notification
At least 72 hours before application of a pesticide other than a least toxic pesticide, {name of school} will post a sign that provides notice of the application of the pesticide:
(A) in a prominent place that is in or adjacent to the location to be treated; and
(B) at each entrance to the building or school ground to be treated.
The sign will remain posted for at least 72 hours after the end of the treatment; be of uniform design with a symbol people who cannot read can easily understand.

Contractors
All pest control companies contracted by the district shall follow all provisions of the policy. Licensed and certified pest control operators are required to include information on any school pesticide application that they perform.