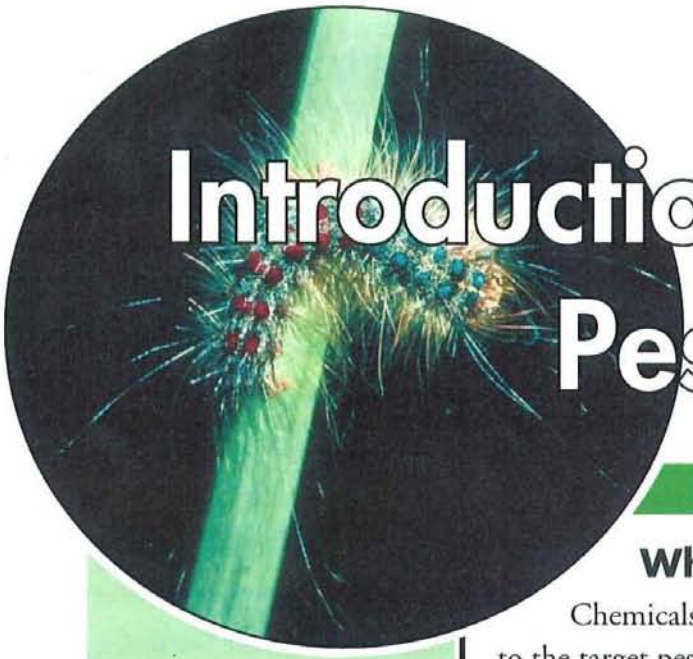

Landscaping practices

Introduction to Integrated Pest Management

What's the Problem?

Chemicals used to control unwanted pests are often toxic, not only to the target pest, but to people and desirable plants and animals. Improper use and storage of toxic chemicals can result in serious risks to public health and the environment. The improper use of pesticides (over use, over spraying, application in or near water resources) can contaminate surface and groundwater. Pesticides can even make their way into our drinking water supplies. Special training, licensing, and permits may be required to apply and store certain pesticides. Also, the frequent use, handling, and storage of pesticides increases the risks associated with unintended or accidental exposure.

What is Integrated Pest Management?

Integrated pest management (IPM) focuses on long-term prevention or suppression of pest problems with minimum impact on human health and the environment.

IPM is an ecological approach to managing pests at acceptable levels in effective, economical, and environmentally safe ways. Rather than eradicating pests, IPM relies on the use of multiple methods of controlling pests while balancing costs, benefits, public health, and the environment. IPM does not eliminate the use of chemical pesticides, but rather it incorporates all available techniques for managing pests. Ideally, an IPM program will prevent undesirable organisms from becoming pests.

Low-cost solutions

In the long-term, integrated pest management is less costly than pesticide-based control. Frequent reapplication of pesticides can be expensive. And, pesticide use and storage is often regulated, requiring special training and licensing, as well as unique management systems and storage facilities.

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IPM Emphasizes a Combination of Many Pest Control Strategies

Where pesticide-based control programs rely almost exclusively on the frequent application of chemicals, integrated pest management programs incorporate a variety of control mechanisms to maintain the pest population below a predetermined threshold level. Control methods may include a combination of the following mechanisms.

- **Biological control** – using beneficial organisms that manage pests, such as predators, parasites and fungi. Care needs to be exercised not to introduce invasive species or organisms that may have unintended consequences.
- **Cultural control** – sanitation, reduce sources of moisture, choose healthy plants, using native plant species, adopting maintenance, design, and planting standards that minimize the spread of pests, etc.
- **Mechanical and physical controls** – traps, cultivation, barriers, adjusting plant location, caulking around windows, and temperature modification.
- **Chemical control** - judicious use of pesticides and other chemicals; use low toxicity pesticides first and target their application.
- **Genetic control (host plant resistance)** – traditional selective breeding and newer biotechnology that produce pest-resistant plant varieties. Generally includes a reliance on native species of plants in landscaping.
- **Regulatory control** – state and federal regulations that prevent the spread of pest organisms.

Benefits of Integrated Pest Management

Ensures long-term control of pests when a maintenance program is used consistently.

Reduces the dependence upon chemical control of pest infestations, and the likelihood of pests becoming resistant to chemical controls.

Decreases the hazards of human and environmental pesticide exposure and the need for storage and disposal of excess pesticides.

Can reduce the cost of long-term pest control.

Barriers to Integrated Pest Management

Perhaps the most significant institutional barrier to IPM will be that pest control responsibilities are often shared by several different departments within a single municipality. Communication and accountability across departmental lines is often difficult. Even within a single department or agency, the responsibilities for pest management may be divided among a number of different staff. For example, janitorial staff, groundskeepers, parks and recreation staff, and facilities management may all have some pest control responsibilities with different priorities and staff answering to different supervisors. And, some departments or facilities may contract their pest control to private companies. Couple this difficultly in coordinating across various segments of the municipality or agency with the natural tendency to resist change and it becomes clear that a strategy for implementing an IPM program is necessary. Therefore, it is essential that the municipality have a written policy on IPM that recognize the different agencies involved in pest control and promotes coordination and cooperation between departments.

Other barriers to adopting an IPM program may include[1]:

- Resistance to change,
- Loss of authority,
- Perceived difficulty in learning new technologies,
- Fear of failure,
- Concern that IPM means NO pesticides,
- Concern for additional costs, and
- Lack of in-house expertise.

For additional information on establishing an integrated pest management program for municipalities and public agencies, see the companion fact sheet, Implementing an Integrated Pest Management Program.

Principles of Integrated Pest Management vs. Continental Pesticide Programs

The table below compares integrated pest management to more traditional pesticide-based pest management.

Principle	IPM	Pesticide-based Programs
Ecologically sophisticated management process	Holistic approach to pest management, relying on extensive knowledge of individual pests & their relationship to the environment	Does not consider ecological relationships. Focuses on controlling individual pests
Information intensive	Collection & processing of information related to pest life cycles, site conditions & maintenance history; previously applied pest control techniques, & presence of predatory agents	Emphasis on identification of pests & optimum eradication methods
Employ all available pest control methods	Integrates multiple management options intended to minimize pesticide use & promote use of products less toxic to non-target species	Generally relies on single method of treatment
Mitigate negative environmental impacts	Minimizes pesticide use & undesirable effects on non-target species & the environment	Relies on timing & equipment technology to limit impacts to non-target organisms
Require appropriate standards for pest control	Minimizes unnecessary treatments by establishing thresholds for pests, tolerance levels for non-damaging organisms, & prevention rather than eradication	Emphasizes early/pre-emptive chemical treatments
Emphasize prevention of pest problems	Considers modification to site design to minimize control treatments and pesticide use	Short-term control requiring repeated pesticide application
Promote the use of methods that provide long-term pest control	Enhances efficiency & improved environmental quality	Repeated pesticide application is inefficient. Potential for long-term negative environmental impacts

For a detailed discussion on developing a municipal integrated pest management program, see the companion fact sheet, *Implementing an Integrated Pest Management Program.*

Source: St. Clair County Health Department

Top right photo: Implementing an IPM program can significantly reduce the amount and frequency which pesticides are applied.

Introduction to Pest Management Control

Resources

The Michigan Department of Agriculture (MDA) Pesticide Web page
www.michigan.gov/mda/0,1607,7-125-1566_2405---,00.html

Introduction to Integrated Pest Management (IPM) for "Urban" Landscapes, IPM Associates, 1996, www.members.efn.org/~ipmpa/ipmintro.html

New York State Integrated Pest Management Program, Cornell University,
www.nysipm.cornell.edu/

Vermont Department of Agriculture, Food & Markets,
www.vermontagriculture.com/homepest.htm

Establishing Integrated Pest Management Policies and Programs: A Guide for Public Agencies, University of California, Agriculture and Natural Resources Catalog,
http://anrcatalog.ucdavis.edu/pdf/8093.pdf

(Footnotes)
[1] Adapted from http://anrcatalog.ucdavis.edu/pdf/8093.pdf

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