



IPM

What is IPM?

IPM stands for **Integrated Pest Management**. IPM is an effective and environmentally sensitive approach to pest management that uses a combination of common-sense practices. Knowledge about pest biology and habitats are used to select the best combination of common-sense practices that will keep pests under control. In greenhouses, fields, yards, and inside homes and schools, IPM uses a series of steps that result in making pest management decisions that control the pests with the least effect on people, pets and the environment.

Understanding the needs of pests 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. Habitat modification may be used in combination with traps, vacuums, biological control or pesticides. An understanding of what pests need in order to survive is essential before action is taken.

By anticipating and preventing pest activity and combining several pest control methods, you can achieve long-term results.

Through IPM you will:

- Identify the pests.
- Take away their water.
- Take away their food.
- Take away their hiding places.
- Eliminate the existing population.
- Deny entry into the building.

Key Points

- Integrated Pest Management (IPM) is an approach to managing pests effectively with the least effect on people, pets and the environment.
- IPM focuses on prevention of pests through sanitation and habitat modification. We look at why the pests are there.
- The six steps in IPM are: inspect and investigate, identify and learn, monitor, choose control methods, evaluate and educate.
- Proper identification of pests, knowledge of their biology, and careful monitoring allow us to target our control methods where the pests are, resulting in effective management with the least effect on people, pets and the environment.
- When we use pesticides as part of the IPM program, we choose pesticides with the lowest toxicity that are applied with the least exposure to people and the environment.



Through IPM we identify and fix conditions that contribute to pest problems.

Why Not Just Use Pesticides Alone?

After World War II, pesticides became a widely available and very effective way to kill pests. They were considered almost magical in what they could do. But by the 1960s it was becoming apparent that there were downsides to the overreliance on pesticides. Some problems include:

- resistance, when the pest is no longer controlled by the pesticide
- movement away from the site of application
- contamination of food, water, air, and people
- exposure to people, pets and wildlife
- high cost from frequent applications
- kill beneficial organisms like lady beetles.

Pesticides can also be misused or used in such a way that people are exposed to them as much or more than the pests are. The presence of pests can create panic that can lead to overuse.



Aladdin's Magic Lamp (circa 1960s) would spread a film of a highly toxic pesticide on all surfaces in the room.

What is a Pest?

A pest is any living thing (plant or animal) that bothers or annoys us, our pets or animals, damages things we value, occurs where we do not want it, or causes or spreads disease. This is a pretty broad definition, and in fact people don't always agree that something is a pest. A dandelion may be a pest to one person and a wildflower to another. A cockroach can be a pest to one person and food to another!

What is a Pesticide?

A pesticide is any substance or mixture of substances used to prevent, destroy, repel pests or reduce the damage pests cause.

While people often think that pesticides are chemicals aimed at insects, common pesticides include household disinfectants such as bleach and kitchen and bathroom cleaners aimed at bacteria. Other common pesticides include those targeted at insects (insecticides), rats and mice (rodenticides), weeds (herbicides), and fungi (fungicides).

All pesticides sold in the U.S. must comply with the requirements of the Environmental Protection Agency (EPA). Most products are registered directly with the EPA and contain their stamp of approval, an EPA Registration Number, on the label.

Some newer products may contain active ingredients that are considered "minimum risk". These are exempt from EPA registration, but must still comply with minimum EPA standards. These products will not have an EPA number.

Additionally, all pesticides must be sold in the manufacturer's original, unopened container with a complete label. It is illegal to sell pesticides in containers without a complete label.

The IPM Decision-Making Process

The IPM approach to pest management uses a basic decision-making process. While the strategies and tactics may change, the steps taken to determine if and when treatment is needed and which methods to use are the same each time. Instead of remembering many specific "recipes" for pest control, pest managers use this decision-making process for all pests. This process helps determine:

- **If** treatment is necessary
- **Where** treatment activity should take place
- **When** action should take place
- **Which** strategies and tactics are best to use

The following pages will provide detail on the overall process that we use to answer these questions.

The IPM Steps

IPM follows six basic steps. Each step is described below with examples. Most of the examples in this resource deal with IPM in schools, homes and other buildings. In managing pests of plants, we would still follow the same basic steps, but the monitoring and control methods would be slightly different.

1. Inspect and Investigate

An inspection reveals where the pests are coming from, what pests might be present, and what conditions are present that can contribute to pest problems. This is the detective stage. Clues gathered from talking to people and inspecting the building and grounds provide a picture of pests, areas, and problems that need to be addressed.

Look for:

- pests
- signs of pests and damage caused by pests (droppings, cast skins)
- conditions good for pests

Discover:

- What pests do you have?
- Where are they coming from?
- What are they eating?

The results of the inspection should be recorded on a form showing what was found in each room or area of the building. Maps of the rooms and building should be made or obtained. The initial inspection helps form the basis for an overall pest management plan. Inspection doesn't end when the management plan is written. Inspections need to occur on a regular basis to monitor and evaluate the pest situations.

2. Identify and Learn

Correct identification of a pest is important in IPM. Knowing that it is a bug is not enough. Since different species have different habits and preferences, knowing the exact identification will aid in the management process.

Once the pest is identified, read about its life-cycle, food sources, preferred habitats, special skills, and natural enemies. The best management plan will take all of these factors into account.

For example, house mice are very curious animals and are constant nibblers. They also travel next to walls and other surfaces and travel the same route over and over. The knowledge of this behavior tells us that snap traps placed next to walls where we have seen signs of the mice (droppings, etc.) should be effective at removing the current population. The Norway rat has different habits and would require different strategies for control. If the actual animals are not visible, then identification requires knowing the difference between rat droppings and mouse droppings, and looking at damage, footprints, and other signs left behind.

3. Monitor

Monitoring is the regular and ongoing inspection of areas where pest problems are occurring or could occur. Information from these inspections is gathered and recorded. Monitoring:

- helps determine if, where and when treatment is needed.
- helps pinpoint infestations and problem areas.
- allows you to evaluate and fine-tune treatments.

Is the population increasing or decreasing? On plants, is the natural enemy population increasing? Has the population reached a level where treatment is necessary? For many indoor and public health pests, the amount we can tolerate is zero or close to zero. In this case, monitoring helps us detect new populations quickly, thus making control easier.

Aids are available to assist in monitoring for many pests. For German cockroaches, we can place sticky traps in places near where we think they are living. Regular checking of the traps will tell us if the population is increasing or decreasing, if the make up of the population is changing (are we catching more nymphs than adults?), and what direction they are traveling in. Sticky traps and other monitoring traps are available for many pests.

4. Choose Control Methods

As mentioned before, IPM emphasizes prevention. We do this by identifying and removing (if possible) the causes of the problems, rather than simply attacking the symptoms (pests).

The information that was gathered in the

previous steps helps determine the best control methods to pick for a particular situation.

Treatment strategies should be:

- least hazardous to human health.
- least disruptive to natural controls in landscapes.
- least toxic to nontarget organisms.
- most likely to be permanent and prevent the recurrence of the pest problem.
- cost-effective in the short and long-term.
- appropriate to the site.

Possible Control Methods Include:

Habitat Modification

In order to prevent pests, we need to learn what about the building or grounds is providing the pests with the habitat they need to thrive. We then modify the habitat so that it no longer provides the pest with a suitable environment in which to live. Habitat modification may involve:

- **Sanitation.** Frequent and careful cleaning can eliminate food for pests. Reducing clutter takes away hiding places.
- **Designing or altering the structure.** Incorporate pest-resistant structural materials, fixtures and furnishings. For example, in commercial kitchens stainless steel wire shelving on rolling casters reduces roach habitats and facilitates sanitation.
- **Eliminating sources of water.** Fixing leaks and eliminating standing water can take away water and moisture that pests need to survive.
- **Eliminating the pest habitat.** Caulking, filling holes and fixing broken doors or windows helps keep the pests from returning. Removing dense vegetation near building eliminates rodent hiding places.

Physical

Physical control methods generally involve mechanical or non-chemical ways of killing or removing existing pests. Some choices include:

- trapping.
- vacuuming.
- barriers.
- “fly swatters”, or removing pests by hand.

Biological Control

Using natural enemies of the pest is one choice for control. Examples of this are cats (who eat mice) or tiny wasps that lay their eggs inside the eggs of cockroaches.

Pesticides

Pesticides may be used in combination with other control methods. Pesticides chosen for the IPM program are usually used when needed to help eliminate existing populations. Other means such as habitat modification keep the pests from coming back.

We choose the least toxic options and target them at where the pests are living and people will not come into contact with them. Fogs and bombs are not used in IPM.

If we use pesticides, we choose and use them as they are intended. This means reading and heeding all instructions on the pesticide label.

5. Evaluate

Evaluation provides a regular opportunity for participants in the IPM program to examine the monitoring records and check to make sure that the program is addressing the pest problems. This step also allows you to adjust and improve the program. Ask yourself the following questions:

- Were the actions we took necessary or would the problem have gotten better without action?
- Did the actions we took and treatments we used solve the problem?
- Could we manage the problem better next time?
- Do we need more or better information to aid in pest management decisions in the future?

6. Educate

Educating others is an important step through all stages of an IPM program. Information that will help change people’s behavior, especially in how they dispose of garbage and store food, plays a very key part in successfully managing pests. Even young children can do their part to take food, water and hiding places away from pests.