



An Introduction to Integrated Pest Management

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Introduction

Pest management professionals commonly discuss “IPM” or integrated pest management. Although IPM is seldom understood by the general public, it is an important framework for how pest management decisions are made. In an effort to increase understanding of this important topic, this publication will explain the fundamentals of IPM and why it is an important pest management tool — for professionals and homeowners.

What is IPM?

IPM is an assessment-based, ecological approach to controlling pests. In an IPM program, the pest is identified to determine important information about its biology, such as the pest’s habitat and life cycle. Once this information is understood, it can be used to develop management tactics to combat the pest problem. Because integrated pest management employs both nonchemical and chemical control methods, it ensures the most effective management tactics are used for each pest situation. This can reduce overall pesticide use. IPM provides practical, cost-effective solutions while protecting people, animals, and the environment.

Guidelines for IPM

The major components of any IPM program include:

- Identify the pest.
- Monitor pest populations and assess their damage.
- Determine a guideline (threshold) for when pest management action is needed (e.g., the point at which the pest is causing economic losses from its activity).
- Attempt to prevent the pest problem.

- Combine nonchemical and chemical control methods to “reduce” pest populations.
- Assess how well the IPM tactics controlled the pest.

It is important to note that the goal of IPM is often not to eliminate the pest population, but to “reduce” it to levels that are considered acceptable (or below threshold levels). Using an integrated pest management program helps promote a more balanced ecosystem.

Nonchemical & Chemical Control Methods

Always determine the identity of your pest before choosing management tactics! Nonchemical controls are usually implemented as a preventative measure before pest populations reach damaging levels. Nonchemical control methods include:

- Host plant resistance – using plant varieties or cultivars that are resistant or tolerant to pest damage (e.g., planting rose varieties that are less susceptible to black spot).
- Biological controls – using living organisms (i.e., natural enemies) to reduce pest populations (e.g., ladybird beetles feeding on aphids).
- Cultural controls – modifying the pest’s habitat to make it less favorable for survival (e.g., using mulch for moisture control; eliminating standing water from plant pots to discourage mosquito breeding; or sanitation practices like cleaning up food spills to discourage household pests).
- Mechanical and physical controls – using hands-on techniques involving simple equipment/devices or changing environmental conditions to reduce pest populations (e.g., using screens/row covers to exclude pests or altering

humidity levels to discourage certain pests like plant diseases).

Chemical control involves the use of pesticides. Pesticides are necessary when nonchemical control methods have failed or are unable to control the problem alone. Pesticide selection depends on the type of pest (e.g., insects, weeds, diseases, etc.) and the target site (i.e., the intended application site). Focus on the most cost-effective and least toxic options when possible. Consider what application equipment you will need, as well as any environmental hazards or storage and disposal issues. Choose the pesticide product that is most compatible with your pest situation and with any nonchemical control methods already in place. When implemented correctly, an integrated pest management program — using pesticides only when necessary — can provide the most balanced approach for controlling pests without harming human health or the environment.

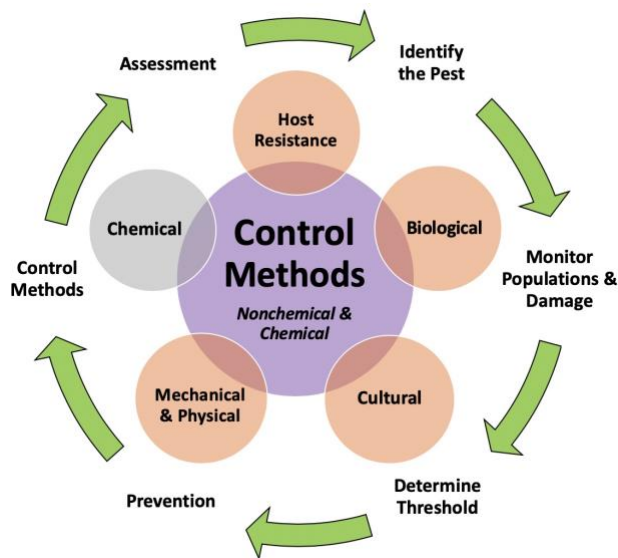


Figure 1. IPM components and management tactics are illustrated above.

Integrated pest management is not only for commercial farming or greenhouse operations. It is an approach that can be used by anyone. IPM should be used in the home, garden, or wherever a pest problem occurs.

Resources for IPM

If you are interested in adopting and implementing IPM, there are many resources available to help you get started.

Additional information on IPM:

- Environmental Protection Agency: <https://www.epa.gov/safepestcontrol/integrated-pest-management-ipm-principles>
- Virginia Department of Agriculture and Consumer Services: http://www.vapesticidesafety.com/integrated_pest_management.shtml
- Virginia Tech Pesticide Programs: <https://sites.google.com/vt.edu/vtppconsumerpse/integrated-pest-management>
- National Pesticide Information Center: <http://npic.orst.edu/pest/ipm.html>
- Pesticide Environmental Stewardship: <https://pesticidestewardship.org/ipm/>

Pest identification resources in Virginia:

- Contact your local Extension agent for assistance (<https://ext.vt.edu/offices.html>). The agent may submit samples to the following Virginia Tech services:
- Insect Identification Lab: <https://www.insectid.ento.vt.edu/>
- Weed Identification Clinic: <https://weedid.cals.vt.edu/>
- Plant Disease Clinic: <https://www.ppws.vt.edu/extension/plant-disease-clinic.html>
- Explore topic fact sheets and publications on the Virginia Cooperative Extension website (<https://www.pubs.ext.vt.edu/>).

Visit Virginia Cooperative Extension: ext.vt.edu

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