

Concepts of Integrated Pest Management for Ornamentals and Turf

Carol A. Sutherland, Extension Entomologist
Ron L. Byford, Extension Entomologist



Integrated Pest Management (IPM) refers to methods of managing pest populations below levels that cause economic or aesthetic damage to parts of landscapes by balancing biological, cultural, chemical, genetic, physical,

or other appropriate and feasible control strategies. Control may be aimed at one or more pests—any arthropod, plant disease, weed or vertebrates in the IPM plan—depending on the scope and complexity of the management system. IPM takes into account interactions among pests, environment, and commodity, as well as any social and economic implications of the chosen control strategies.

The IPM concept comes from realizing that any disruption caused by one pest tends to affect other pests and any beneficials in the urban, range, or cropping system. Larger-scale systems with greater species diversity tend to undergo fewer disruptive pest outbreaks. For these reasons, it has been easier to develop IPM programs in fairly stable, long-term environments, such as nut or fruit orchards, forests, or commercial alfalfa fields than in annual crops or in home gardens. Nevertheless, the concept is useful and merits consideration by serious gardeners.

While this section briefly explains a concept that you may have heard and read about for years, consider working out a rough IPM plan for your home landscape or a specific garden. Sketch a map of the site and make notes on paper (or computer) to describe what is planted there, how it is maintained, and what your goals are for managing it. This exercise should help you appreciate the complexities of the management decisions involved in developing IPM plans. List several management options for each pest. Some can be very direct (a pesticide application made at a certain time), while others could be more indirect, creative, or even fanciful (a mechanical device to scare away pest birds from a fruit tree). This could be an excellent project for you and your family to consider. Older children in search of a science project for school might be encouraged to participate and carry the project to completion with your input.

Approach

IPM systems need to be flexible, broad, and inclusive. Several approaches might be considered for each problem at hand. One possible approach follows:

1. **Define your management unit.** A single garden or field may be a unit if a soilborne nematode (of low mobility) is the key pest. A larger unit would be required for highly mobile pests such as winged grasshoppers. This may be impossible for homeowners acting alone on behalf of their own properties, and it probably would not be feasible even for a community of contiguous homeowners to attempt for even the most damaging pest species imaginable. Obviously, some pests will be managed more easily on small properties than others.
2. **List specific pests that must be managed and perhaps some occasional pests that need attention.** Pests could include insects, mites, weeds, vertebrates, and plant pathogens, including nematodes. Use past experience to develop your list. Seek help with identifications and confirmations as needed.
3. **Develop an optimum pest management program that lists and uses multiple control tactics.** Combinations of control tactics need to be effective and as compatible as possible with beneficial and non-target organisms as well as the environment. The program can vary with time of year and location for your management situation. Consider possible interactions among your listed pests. For example, if certain weeds harbor a pest on your list, you might determine feasible methods of controlling these weeds on your property. On the other hand, planting certain flowering plants might provide food sources for beneficial arthropods in your yard. These might be induced to stay in your yard while potential target pests become established and begin to increase.

4. **Determine some reliable monitoring techniques.**

Sampling methods must accurately assess numbers of pests and beneficial organisms per unit of field, orchard, plant, stem, or leaf. Keep a notebook of this information to determine population trends and make management decisions. If available, pheromone traps might provide information on pest presence and general trends in numbers. Remember that, most of the time, you won't be able to "trap out" a pest with these devices.

5. **Determine economic or aesthetic injury levels for plants in your landscape.**

Estimate the costs of control, particularly if you are considering different options, such as an insecticide application program versus releasing a beneficial. If a particular plant in your landscape is especially prone to difficult-to-control pests or if control costs for a key pest are excessive, consider replacing that plant with a species requiring less maintenance. Realize that a perfect landscape may cost more to realize than you can afford in time, resources, or money.

6. **Develop descriptive and predictive models.**

These don't have to be elaborate or even mathematical. Models can predict recurring pest problems seasonally, and help you make timely orders or purchases of any necessary management tools. While you're at it, consider the likely times for harvest (for fruits or vegetables), peak color (for blooming plants), or normal foliage drop. Once these periods are noted on your predictive models, you can more easily understand the time windows when certain pests have to be managed with appropriate tools. If any kind of pesticide is part of your management strategy, read or re-read the labels in their entirety for directions involving timed applications and pre-harvest intervals. For any biological agent considered in your IPM strategy, what is the optimum time for release and when is the host most susceptible to the biological agent?

Objectives

New Mexico IPM objectives are to develop and implement programs and disseminate information on pest management through the approaches listed previously. Some possible objectives include:

- Developing effective monitoring techniques for pest and beneficial populations, and determining economic or aesthetic injury levels to facilitate management decisions.
- Optimizing pesticide use, reducing impact on

nontarget organisms, and combining this use with other management practices where practical.

- Improving crop yields, quality, and economic returns, and reducing aesthetic damage to ornamental plants and turf by a multitactic approach to managing pest populations.

Advantages of Integrated Pest Management

Experience has shown that pests develop resistance to excessive pesticides. Pesticides must be employed carefully and sparingly to extend their usefulness. If IPM leads to reduced pesticide use, the reduction also lowers production and maintenance costs for growers and gardeners.

Most pesticides also are petroleum-based chemicals, a diminishing fossil energy resource. Finally, many pesticides are toxic to several beneficial organisms that help control pests or contribute to the enjoyment of our environment. Pesticides should be used only when necessary and must be applied correctly to minimize these problems.

IPM combines biologically based pest control techniques to provide obvious advantages to the grower and society. It does not necessarily reduce pesticide application, but stresses more logical pesticide use. Correct pesticide selection and timing can be a powerful tool to improve market grade and to greatly increase grower returns, particularly in commercial situations. A pesticide used unwisely can actually cost more and abuse the environment.

New Mexico IPM Programs

New Mexico has organized IPM programs on rangeland, alfalfa, and cotton. New projects on forests, tree fruits, and urban pests have been initiated recently. The rangeland, alfalfa, and cotton projects are now conducted mainly by consultants, field workers and growers, with New Mexico State University providing updated information.

IPM has played and will continue to play a major role in reducing or eliminating pesticide threats to endangered species and groundwater pollution and in reducing the problems of pesticide resistance. IPM encompasses organic production techniques for a sustainable future for New Mexico's growers and homeowners.

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