IPM: Integrated Pest Management

IPM, or Integrated Pest Management, is a comprehensive, multi-pronged approach to prevention and control of garden pests with special regard to environmental and human health. A successful IPM strategy relies on a continuous flow of knowledge, implementation and evaluation of techniques used to produce positive results. While starting an IPM program may sound difficult, it is actually fairly straightforward. Begin with knowing your plants and their pests, then learn the four methods of control: **cultural, physical/mechanical, biological and chemical**.

Components of IPM

Cultural: Healthy plants are better equipped to resist pests then their weak and diseased counterparts. This method approaches appropriate plant selection, healthy cultivation practices and proper soil fitness as pest preventative measures.

Physical/Mechanical: Environmental modifications or physical pest removal is employed as a direct action to curb or eliminate pest populations.

Biological: Predators, Parasitoids, Pathogens (the three P's) are engaged as natural enemies of pests in their environment. Predators hunt and consume pests, parasitoids utilize pests as hosts in their life cycle, and pathogens introduce disease.

Chemical: Pesticides used responsibly and selectively can offer effective control without interfering with the biologicals. Chemical control is best used sparingly, or after other methods fail.

Cultural Controls

Fact: Vigorous plants and healthy soil are key to resisting and preventing pest problems.

IPM Goal: Promote healthy plants and soil

Techniques:

1. Choose disease resistant, certified and native plants whenever possible.
2. Know the timing of pest cycles and adjust planting times and rotation methods accordingly. Make your planting area unattractive to pests.
3. Manage irrigation and fertilization to avoid stress and promote growth.
4. Conduct a soil test to read nutrient levels and pH. This strategy allows for a targeted fertilization program with application of only necessary nutrients, supporting optimal growth and preventing unintentional harmful soil toxicity.
5. Mulch surface around plants with compost in the spring, whether around existing plants or new plantings. Use organic mulches around plants and between crop rows. These will provide nutrients upon decomposing, will help warm or cool the soil, and retain moisture.
6. In the summer, solarize the soil to kill weed seeds, insects, nematodes and soilborne pathogens.

Physical and Mechanical Controls

Fact: Mechanical pest control is an effective yet inexpensive way to prevent and counter pest infestations in the home garden.

IPM Goal: Deter or eliminate pests while preserving beneficial organism population.

Techniques:

1. Scouting: Inspect frequently for evidence of insects or insect damage. Survey the garden following the same pattern, observing the area around the plants as well. Inspect plants from roots up, stems, undersides of leaves, buds and blooms, and note findings.
2. Hand-pick and destroy non-beneficial foliage-feeding insects and eggs whenever found. Locate and remove possible habitats, like debris piles or standing water, where insects live and breed.
3. Use water-pressure sprays carefully, preferably in early morning (to prevent spread of fungal diseases) on sturdy plants for aphid and spider mite control.
4. Try pheromone attractants or sticky traps, not only to contain, but to monitor the scope of infestation.
5. Other options like insect vacuums, stem sleeves and mesh barriers are also effective, environmentally-sensitive means of pest control.

Biological Controls

Fact: Hosting biological predators in the home garden is a powerful, eco-friendly and sustainable process for pest control.

IPM Goal: Create and maintain an environment where pests are controlled by predators, parasitoids and pathogens.

Techniques:

1. Introduce a new population of natural insect enemies (that are not currently present), to curb pest numbers, or increase a population of an existing natural enemy.
2. Instead of pesticide use, choose to encourage and protect native natural enemies, such as birds, reptiles, bats, and other predatory insects, by creating a habitat and providing life resources, like water, shelter, and food (flowering plants, berries, etc).

Chemical Controls

Fact: Responsible, selective use of the appropriate class of pesticide can be effective and still support an ecologically sensitive IPM strategy.

IPM Goal: Target exclusively the problem pests as a final effort, while protecting beneficials and the environment.

Techniques:

1. Identify the primary pest and study their life cycle; use selective chemistries to target the pest, and spot-treat just the infested plant parts. Know your enemy, know your options.
2. Always read and follow label instructions, and use protective equipment when handling, applying and storing pesticides.
3. Consider the use of microbial insecticides or insect growth regulators as they specifically kill by disrupting life-cycle activities.
4. Botanicals, minerals and metals require specific application time, frequency and conditions. And like any insecticide, they should be used with caution and care.

Most gardeners need only to learn more about their own garden environment - host plants and their pests - to move forward with an IPM strategy. Armed with this knowledge, it should be a straightforward task. The next steps? Putting the proper controls in place, vigilance, and evaluation.

The Oklahoma Cooperative Extension Service provides sound information on starting your own IPM program. Simply follow the *links at the end of this article* to read more.

IPM Resources

Integrated Pest Management (IPM) for the Home Landscape - L-429

Cultural
Non-Chemical Methods for Controlling Diseases in the Home Landscape and Garden - EPP-7652
Soil Solarization for Control of Soilborne Diseases - EPP-7640
Earth-Kind Gardening Series: Cultural Control Practices - HLA-6431
Oklahoma Gardening: Organic Fertilizers

Physical/Mechanical
Mechanical Pest Controls - HLA-6432

Biological
Biological Pest Controls for the Home Landscape - HLA-6434
Conservation Biological Control for the Home Landscape - HLA-6447
Beneficial Insects - EPP-7307
Conserving Beneficial Arthropods in Residential Landscapes - E1023

Chemical
Earth-Kind Gardening Series: Botanical Pest Controls - HLA-6433