



Home Grounds Fact Sheet

Integrated Pest Management

A good horticulturist strives to maintain a healthy plant; one that is vigorously growing and free of major pest problems. Integrated pest management (IPM) is a simple, practical and flexible way to help manage pests when they attack plants. IPM involves the use of a blend of pest management tactics to protect plants against insects, mites, plant diseases, nematodes and weeds. People who practice IPM monitor their plants and integrate cultural, biological, mechanical and chemical techniques to suppress plant pests.

Basic IPM principles

Identification and diagnosis of the pest

The first step in pest control is accurate identification. It is important to know the pests that are likely to show up, where to look for them, and how to identify them. With IPM it is necessary to understand the biology of a pest and its interactions with other organisms and its environment. Diagnosis is the process of recognizing a disorder from its symptoms and signs. Early, accurate identification and diagnosis are essential to a successful IPM program. Since cultural problems often affect pest problems, these must be identified as well.

Monitoring

Monitoring is the regular inspection of plants to determine the nature of pest and cultural problems. This information is then used to make decisions about pest management. Regular visits enable the horticulturist to follow plants through time and pinpoint developing problems early on. Small problems detected in this way are controlled with less effort and expense than large problems. If pesticides are needed, it is often only as a spot application, which can reduce the potential for misapplication and help to conserve the natural enemies of harmful pests.

Economics

A good IPM program also recognizes the economic aspect of pest management. This includes the notion of using the most cost-effective set of management tactics for a particular situation as well as initiating control only when the threshold has been reached.

■ **Economic injury level** is the lowest pest density that will cause economic damage. Economic damage is the amount of injury that will justify the cost of artificial control measures. This economic injury level may vary from area to area, season to season, or with our changing scale of economic and aesthetic values.

■ **Economic threshold** is the pest density at which controls should be used to prevent an increasing pest population from reaching the economic injury level. The economic threshold is lower than the economic injury level to permit sufficient time for the initiation of control measures and for these measures to take effect before the population reaches the economic injury level.

Pest management strategies

As mentioned earlier, IPM uses a combination of compatible control techniques. These include cultural, biological, mechanical and chemical techniques.

■ **Cultural controls** are modifications of horticultural practices to disrupt or reduce pest populations. Correct fertilization and watering are major cultural practices that influence the health of plants and their susceptibility to pests. Growing healthy plants is one of the best ways to reduce pest problems.

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- **Biological control** refers to the use of natural enemies to control pests. The actions of parasites, predators or pathogens on a host or prey population is common in nature. Enhancing and preserving biological control agents is an important component of IPM. In some cases it is advantageous to release commercially reared natural enemies to augment control.
- **Mechanical control** refers to barriers or traps to exclude or catch pests, such as a row cover over new cabbage transplants to keep root maggots and cabbage loopers from reaching the plants.
- **Chemical control** is the most common technique and includes the use of pesticides. Pesticides are manufactured and formulated in many ways. If applied at the correct rate and time, pesticides are usually safe and effective. Organic insecticides such as insecticidal soap and horticultural oil are readily available.
- **Plant selection and resistance** involves the selection and use of plants that are disease resistant and compatible with the existing conditions (shade, soil type, drainage, exposure) of the desired planting location. Always choose disease-resistant crabapples, junipers and tomatoes, to name just a few.

An integration of all the above control methods is the best way to get safe, long-term pest management with minimal adverse effect on the surrounding environment.

Record keeping

Brief, concise and accurately recorded information on a data sheet is the best way to make a diagnosis or decision. IPM programs rely on records to make field recommendations. As program evaluations and future plans are developed, good field records are essential. The time spent recording information on a ledger or data sheet is often hard to justify as productive. All production inputs must be recorded: date, time, control method and results obtained. Pest managers trying to make a diagnosis of a problem without records are at a serious disadvantage and will overlook potential causes.

Why IPM?

For the last 40 years the dominant strategy for pest control has been the use of chemical pesticides. These are inexpensive and often used as a quick fix to solve a pest problem, and have replaced many of the pest management tactics used for centuries. The overuse and misuse of these chemicals has created many ecological and sociological problems, leaving many pest managers looking for alternatives. We must consider that pesticides are just one of many tools used to effectively manage pests. Use of IPM practices helps the horticulturist to grow and maintain healthy plants while minimizing adverse impacts.

Reference: Gerard Ferrentino, Ornamentals IPM Coordinator, Cornell University