

Monitor Pests and Keep Records



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Inspecting your plants on a regular basis is essential to identifying and evaluating plant problems in their early stages. You then can determine what, if any, action should be taken to manage these problems.

To monitor the health of landscape plants effectively, you must be able to identify the plants, their pests, and their diseases, and understand how all of these are affected by the weather and by the environment. Professionals who are trained to do this are called Integrated Pest Management (IPM) scouts or Plant Health Care (PHC) technicians. Whether you attempt to develop these skills yourself or hire a professional to assist you, you will benefit from understanding the following components of monitoring your landscape plants.

RECOGNIZING SYMPTOMS AND SIGNS

To determine the cause of a plant problem, you must be able to interpret clues on the plant. *Symptoms* are abnormal changes in the plant that result from disease or insect problems, an unsuitable growing environment, accidental herbi-cide exposure, or other conditions. *Signs* are a visible part of the cause of the problem, such as insects, insect eggs, or part of a fungus.

Some symptoms of insect damage to plants are: discoloration or distortion of leaves, blossoms, or twigs; chewing damage; cracked bark; and dieback of plant parts. The appearance of the damage sometimes is enough to identify the insect group that caused it even if the actual insects are not seen. Symptoms of some plant diseases are: spots or dead areas on leaves or stems, abnormal growth or coloration, and sudden wilting.

INTERPRETING PHENOLOGICAL EVENTS

You may have heard the old saying, "plant corn when oak leaves are the size of mouse ears." Although oaks have no direct connection with growing corn, farmers have learned that this stage of oak leaf development indicates that the soil temperature is right for corn seed germination. They use the oak tree as an

easy-to-read, living gauge to keep track of something more difficult to see and measure—how many warm days have occurred so far this season, and how warm those days have been. This is an example of correlating a phenological event (oak leaf development) to a climatic condition (soil temperature).

People who study phenology keep track of easily observed stages of plant development and climatic conditions, such as temperature. They then try to correlate the phenological event with other events that are less easily observed, such as the hatching of insect eggs or the germination of fungal spores. These correlations in turn can be used to predict when a pest will appear and when it is most susceptible to effective management methods. For example, when blossoms of saucer magnolia (*Magnolia soulangiana*) are in the pink bud to early bloom stage, larvae of the destructive Eastern tent caterpillar usually are hatching from eggs. This is the optimum time to use the biorational product *Bacillus thuringiensis* to reduce the number of young larvae on infested trees.

To record how much warmth a site has received during the season, scientists measure temperature in units called growing degree days (GDD). Growing degree days accumulate as the season progresses. The Southeast Pennsylvania Integrated Pest Management Research Group records growing degree days each year and correlates them to insect, mite, and plant development.

Here is another example of how phenological interpretation can be used with growing degree days. Suppose pine needle scale has been a problem in past years on a tree, and the grounds manager wants to prevent further outbreaks. By checking references such as the Southeast Pennsylvania IPM Research Group's report, he or she learns that the eggs of pine needle scale hatch between 200 and 350 GDD. This is also about the same time that horse chestnut (*Aesculus hippocastanum*) blooms. When 150 GDD have accumulated or when horse chestnut just starts to bloom, it is time to scout pine trees for newly hatched pine needle scale crawlers. The crawler is the life stage of pine needle scale most

vulnerable to chemical treatment methods. If crawlers are found, it would be the right time to initiate spraying.

MONITORING A LANDSCAPE INCLUDES THE FOLLOWING STEPS

1. Know the botanical names of your landscape plants, and learn about their preferences and common problems.
2. Regularly scout plants in the landscape. Frequent inspection is the best way to discover a problem in its earliest stages, when it can be easier to control. Some items that are helpful while monitoring are a clipboard and record-keeping sheet, a magnifying lens, and small plastic bags for collecting specimens. Insect traps are commercially available to detect certain pest species.
3. Consider the general appearance of each plant from a short distance, and ask yourself if it looks healthy. Are there dead areas? Is it wilted? Are any leaves discolored or abnormally curled?
4. Stop at each plant and slowly scan it. Watch for movement that might indicate the presence of an insect or mite. Turn leaves over and look at their undersides. Inspect stems, branches, and leaves for insects, holes, webbing, or split areas. Vigorously strike a branch on a white cloth or paper. See if any pests fly or hop away, and inspect the ones that fall off. Look carefully; mites are small and it may take several seconds for them to start moving on the paper.
5. Identify what you find. Some insects are beneficial in the landscape. Use references to learn about the life cycles of insects and diseases you observe. Some good references are listed below under "Selected References."
6. Decide what injury level is acceptable. Is the damage actually affecting the health of the plant? If not, does the damage make the plant look bad enough to detract from the appearance of your landscape?

7. Select a pest management method. Choose a method that is most effective against the pests and least disruptive to other organisms and the environment. Use pest management methods when the pest is most vulnerable.
8. Evaluate the action taken. Did it work? If not, why not? What might work better next time? Could you make changes in the landscape to avoid the problem in the future?
9. Keep a record of the observations you make when monitoring your plants and of the pest management methods you have tried. Records can help you manage landscape plant problems during the current growing season, evaluate management methods, and predict problems in the future. The attached form summarizes some of the observations that should be recorded when monitoring landscape plants.

SELECTED REFERENCES

Diseases of Trees and Shrubs. 1987. Sinclair, Johnson, and Lyon. ISBN: 0-8014-1517-9.

"Growing Degree Days Weekly Report," from Southeast Pennsylvania IPM Research Group, Penn State Cooperative Extension, Montgomery County, 1015 Bridge Road, Suite H, Collegeville, PA 19426-1179. March 1 to early October.

Insects That Feed on Trees and Shrubs. 1988. Johnson and Lyon. ISBN: 0-8014-2602-2.

Penn State entomology fact sheets are available at your local Penn State Cooperative Extension office.

Penn State plant disease fact sheets are available on the Penn State Department of Plant Pathology Web site at <http://www.cas.psu.edu/docs/CASDEPT/PLANT/ext/fact.html>

Woody Ornamental Insect, Mite, and Disease Management Guide. 1995. Penn State Cooperative Extension. Penn State Publications Distribution Center, 112 Agricultural Administration Building, University Park, PA 16802-2600.

FOR MORE INFORMATION

Penn State Cooperative Extension, Delaware Cooperative Extension, and the Southeast Pennsylvania IPM Research Group have been working together to provide information and educational materials on IPM and landscaping.

This fact sheet, "Monitor Pests and Keep Records," is part of a series of educational fact sheets about understanding and using Integrated Pest Management. Other topics in the series include:

- Creating Healthy Landscapes—Introduction
- Choose Plants Wisely
- Plant With Care
- Promote Plant Health
- Keep Plants Well Groomed
- Pest Management Methods

Copies are available from your local extension office.

The Southeast Pennsylvania IPM Research Group is a collaboration of university and industry horticulture professionals who are inspecting landscapes across the region to monitor pest populations and share current IPM data. The group is partially supported by the Pennsylvania IPM Program (PAIPM). For more information about the research group, contact: Penn State Cooperative Extension, Montgomery County, 1015 Bridge Road, Suite H, Collegeville, PA 19426-1179; telephone: (610) 489-4315.

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