

Magic from the Manual: INSECT MANAGEMENT
Part I: Insect Problems on Trees and Shrubs

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Insects cause many kinds of plant disorders in the nursery and landscape and it is important to distinguish insect damage from disease and environmental damage. Symptoms of destructive insects are usually observed before the insects themselves are found. In many cases, suspected insect injury can be confirmed by locating the causal insect. However, locating an insect on a plant does not necessarily mean that particular insect is responsible for the plant's symptoms. In addition, damage is not always observed until after the insects have completed the damaging part of their life cycle and have left the plant. Some common insect-induced plant symptoms may be confused with plant diseases. A careful comparison of all possible causes of plant symptoms is necessary to make a correct diagnosis of the plant problem. The insects mentioned in this chapter are among the most common insects found in Minnesota. Integrated Pest Management (IPM) which includes the use of pesticides is the most effective treatment for insect problems. Follow the label when pesticides are necessary for effective treatment. See Chapters on Pesticide Usage, Health and Safety, and Landscape Management for additional information.

Leaf Spots

Although leaf spots are most frequently caused by plant pathogens, they may occasionally be caused by sucking insects, such as plant bugs and leafhoppers. When the insect's saliva is toxic to the plant, a dead spot may develop around the point where the insect feeds. Occasionally, holes may develop when the damaged tissue becomes brittle and falls from the leaf. Holes produced in this way are 'BB' shot to pencil sized and are round.

Branch Dieback

Wood-boring insects such as the bronze birch borer may cause significant damage to plant vascular tissue. This results in dying back of the infested limbs or branches. Branches damaged by other causes, or weakened trees in general, may be particularly susceptible to insect borers. Branch dieback may be caused by diseases, environmental factors, cultural factors, insects, or a combination of two or more of these factors. Another type of branch dieback is twig dieback caused by twig girdlers or twig pruners. Twig dieback may be caused by beetle larvae boring inside of twigs or by the feeding of adult beetles that completely girdle the twigs. This type of damage occurs most frequently on oaks and maples.

Bronzing

From a distance, trees heavily infested with spider mites may appear discolored. Closer examination of the affected foliage reveals a bronze discoloration of infested leaves. Confirm a diagnosis of spider mite injury by tapping infested branches over a white piece of paper. Dislodged spider mites will appear as tiny specks moving on the paper.

Cankers and Swellings

Many beetle larvae and caterpillars bore into tree trunks or limbs, causing them to swell. When these spindly-shaped galls are cut open, insect tunnels and frass should be visible. Insect borers often attack trees that are weakened or damaged by other causes. In some cases, borers and plant pathogens are associated with the same canker.

Chewed or Skeletonized Leaves

Leaf beetles and some sawflies, chew the plant tissue off the upper or lower side of the leaf, while leaving the opposite leaf cuticle and the veins intact. The damaged leaf then looks like a lacy skeleton of a leaf. Most caterpillars and adult beetles chew through the entire leaf. The damage may appear as tiny to large holes in the leaf, or as irregularly shaped leaves with jagged edges. If plant leaves are still growing when the insect feeds, the damage may later appear to have smooth edges around the feeding holes; only insects cause this type of damage.

Leaf Drop

Leaf drop is generally caused by plant pathogens, squirrels, or environmental problems. One exception is the early summer leaf drop of maples caused by the maple petiole borer. Diagnose leaf drop caused by insects by looking for tunneled or chewed leaf petioles. Heavy infestations of spider mites may also cause premature leaf drop. Euonymus plants infested with the two spotted spider mite, or honeylocust infested with the honeylocust spider mite will drop leaves in response to mite feeding injury.

Leaf Curling, Puckering or Rolling

The saliva of some sucking insects, especially aphids, may cause plant leaves to fold, curl, or pucker. These insect symptoms can be confused with some plant diseases that cause similar symptoms. Diagnose the damage as insect damage if the aphids themselves are inside the curled leaves. Some caterpillars, called leafrollers, use silk threads to hold leaves in a curled or rolled shape. These leafroller caterpillars may also be found inside the rolled leaves.

Leaf Miners

Trees heavily infested with leaf miners may appear brown, as if portions of the tree are dying. Upon examination of damaged leaves, the leaf miners become apparent. Leaf miners feed inside the leaves between the upper and lower leaf surfaces, leaving only a paper thin cuticle covering the mined areas. Brown frass and the wormlike larva can be found between the leaf surfaces.

Stem and Leaf Galls

Several groups of insects have gall-forming species. These include the gall wasps, gall midges, aphids or adelgids, eriophyid mites, and sawflies. Stem and leaf galls may also be caused by plant pathogens. Leaf galls, however, are usually caused by an insect or mite. A small aphid or midge-like larvae may be found in a fresh leaf gall. In other cases, the causal agent may be too small to see without magnification.

Witches' Brooms

Some eriophyid mites and aphids cause a witches'-broom effect on infested plants. A good example is the dense, twisted foliar growth of honeysuckle twigs induced by infestations of the honeysuckle witches'-broom aphid. Similar dense, irregular growths can be caused by mites or plant pathogens.

Erinea Leaf Patches

Some microscopic mites, called eriophyid mites, give off substances that cause plant tissue to grow in an irregular manner. One common type of induced growth is fuzzy or spongy patches on leaves, called erinea. These patches usually appear between leaf veins, are irregularly shaped, and may be red or silver. Because the mites are too small to see without a microscope, the damage may be incorrectly blamed on a mysterious plant disease.

Pitch Flow

Many trees respond to trunk or twig injury by producing sap or pitch around the injured area. The pitch flow is believed to be a tree defense mechanism to prevent additional injury from insects and diseases. Wood-boring insects and bark beetles usually induce the plant to produce pitch at the location where the insects are actively causing injury. Plant pathogens and mechanical injury can also induce a pitch flow.

Common Groups of Insects That Damage Landscape Plants

Although thousands of insect species have been identified as pests of landscape plants, most of them can be artificially placed into 26 groups within seven major categories: **sucking, leaf-chewing, casemaking, gall-forming, root-feeding, stem-boring, and scale insects**. The same classification system can be used to recommend control strategies. Knowing what kind of insect is responsible for plant damage is critical to successful control of insect problems because various insects are more susceptible to some insecticides than others. Classifying insect pests into these categories is adequate for effective control of 95 percent of the insect problems likely to occur on landscape plants.

Sample Test Questions:

True/False

1. T F Sometimes Insect Damage is not noticed until after the Insect has completed its lifecycle and has left the plant
2. T F Skeletonized leaves are a sign of Leaf Miner Damage
(answers 1 T, 2F)

Multiple Choice

1. One of the following is not one of the 7 major categories of landscape plant pests
 - a. Gall Forming
 - b. Stem Boring
 - c. Leaf Sucking

- d. Flying
 - e. Scale
2. Which one of the following is NOT likely to be insect related damage
- a. Leaves where all or part of the insides are missing, leaving only the cuticle On the top and bottom surface
 - b. Tightly Curled or Wadded up leaves
 - c. Round Growths surrounding small branches of Oak Trees
 - d. Lightly Colored leaves with Dark Veins on a Pin Oak
 - e. “D” shaped holes on Ash Tree
- (answers 1-d, 2-d)

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