

Maple Diseases & Insect Pests

Diseases

Leaf Scorch: On maple (*Acer* species) trees a number of problems cause symptoms that are generally classified as leaf scorch. Scorch symptoms are light brown or tan dead areas between leaf veins or around the leaf margins. Occasionally the leaf margins are yellow or chlorotic. Scorch symptoms tell us that one or more of the following factors are affecting the tree:

- Physiological leaf scorch is the most common. It is caused by dry weather, combined with wind and high temperatures. When trees do not get enough water they will scorch. The symptoms are on all parts of the tree or only on the side exposed to sun and wind. Scorching due to dry soil may be overcome by proper watering.
- A response to an undesirable soil contaminant, such as salt (applied to roads for wintertime ice control), accumulation of fluorides in containerized soil mixes with perlite, or high levels of phosphate fertilizers.
- A reaction to a vascular pathogen, either fungal or bacterial.

Anthracnose: This disease is caused by the fungus *Aureobasidium apocryptum*. Leaves and buds may turn brown and die, followed by twig and branch dieback. Infected trees may be deformed with crooked and angular branches or witches' brooms (clusters of shoots growing from one area of a branch). This disease is most severe during wet weather.

Prevention & Treatment: The most effective control is to replant with resistant trees. Spraying three times at two-week intervals with a copper-based fungicide, mancozeb, chlorothalonil, or thiophanate methyl starting when the leaves begin

to unfurl in spring will provide control (see Table 1 for specific products). Read and follow all directions on the label.



Anthracnose of maple (*Aureobasidium apocryptum*)
Photo by Paul Bachi, Bugwood.org

Bacterial Leaf Scorch: This disease is caused by the bacterium *Xylella fastidiosa*. Symptoms often start out as a marginal chlorosis or yellowing of the leaves before they fade to a drab green or brown color. Presumably the symptoms develop because of water stress within the water conducting vessels. Diseased trees lose vigor, and branches or entire trees may eventually die. The symptoms are most noticeable in late summer to early fall, following extended periods of drought. The bacteria are transmitted by leafhoppers and vegetatively through grafts and cuttings.

Prevention & Treatment: In general, practices that encourage root development and root function are recommended. Incorporate organic soil amendments into the soil to improve aeration and drainage of clay soils or to improve the water holding capacity of sandy soils. Irrigate during

periods of drought. The disease has been suppressed by oxytetracycline injections, but not cured. A certified arborist should be contacted if chemical control is needed.



Bacterial leaf scorch of maple (*Xylella fastidiosa*)
Photo by John Hartman, Bugwood.org

Phyllosticta Leaf Spot: This disease, also known as purple eye, is caused by the fungus *Phyllosticta* spp. On the leaves, spots appear with pale yellow centers and purple borders. The spots are irregularly round and ¼ inch in diameter. Black fruiting bodies of the fungus develop in a circle in the centers of the spots. These fruiting bodies occur in greater numbers on the upper leaf surface. Severe infection can result in partial defoliation of the tree. Often the disease goes unnoticed until leaf accumulation occurs under the tree.



Phyllosticta leaf spot of maple (*Phyllosticta cotoneastri*)
Photo by Paul Bachi, Bugwood.org

Prevention & Treatment: The fungus survives the winter in fallen leaves. In the spring spores are

produced and dispersed to the new leaves of susceptible trees. Rake up all fallen leaves. Fertilization and watering may help to reduce the disease. ‘Autumn Flame’, ‘Tilford’ and ‘Gerling’ red maple varieties are relatively resistant to leaf spot. Spraying three times at two-week intervals with a copper-based fungicide, mancozeb, chlorothalonil, thiophanate methyl, or triadimefon starting when the leaves begin to unfurl in spring will provide control (see Table 1 for specific products). Read and follow all directions on the label.

Tar Spot: Tar spot is caused by the fungus *Rhytisma acerinum*. Spots arise in late spring or early summer after leaves attain full size. At first the infected tissue is light green or yellow. Then, during late summer, raised, shining black, tar-like dots develop within the yellow spots on the upper leaf surfaces. The lower surface of a leaf beneath a large tar spot turns brown, but the surface beneath speckled tar spots remains yellow. Leaves with multiple spots may wither and drop prematurely, but seldom so early or in such quantities as to threaten the health of the tree.

This disease is more common in the forest, but may be seen in some landscape situations. Tar spots are among the most showy and least damaging foliar diseases.



Tar spot of maple (*Rhytisma acerinum*)
Photo by Andrej Kunca, Bugwood.org

Prevention & Treatment: The fungus survives the winter in fallen leaves. Rake up and discard the leaves in fall. Spraying three times at two-week intervals with a copper-based fungicide, mancozeb, or triadimefon starting when the leaves begin to

unfurl in spring will provide control (see Table 1 for specific products). Read and follow all directions on the label.

Insect Pests

Aphids: Aphids are soft-bodied insects that range from $\frac{1}{16}$ to $\frac{3}{8}$ inch long. They may be green, yellowish, pink, gray or black. They feed by piercing plant tissue and sucking plant sap. They prefer feeding on new growth in such areas as shoots, buds and the undersides of leaves. As they feed on plant sap, they excrete honeydew (a sugary material). The sooty mold fungus feeds on the honeydew, resulting in unsightly, dark fungal growth.



Woolly alder aphid (*Paraprociophilus tessellatus*)
Bob Lepak, Bugwood.org

Woolly alder aphid (*Paraprociophilus tessellatus*) is gray to black in color. It gets its name from the fluffy, white wax found on its abdomen. It requires alder and silver maple to complete its life cycle. Occasionally, it is found on red maple. Colonies of these pests are obvious because of their white, fuzzy appearance. They are usually seen on leaves, twigs or bark. Although infested leaves shrivel and drop early, the pests cause little permanent damage. As a

result of the honeydew, sidewalks and cars become sticky.

Prevention & Treatment: Several natural enemies, such as ladybird beetles (ladybugs) and lacewings feed on aphids. As much as possible, these predators should be allowed to reduce aphid populations. Controlling this pest on a large tree using chemicals is expensive and often not practical. Since little permanent damage results from woolly alder aphids, tolerating some damage is a good choice. As a result of their phenomenal ability to reproduce, aphids are very difficult to control with insecticides. Leaving one aphid alive can result in the production of a new colony very quickly. In addition, the use of insecticides kills the beneficial insects that normally keep aphid populations under control.

However, if natural predators do not reduce aphid populations sufficiently, the following foliar spray insecticides are recommended: cyfluthrin, lambda cyhalothrin, permethrin, bifenthrin, pyrethrin and neem oil. Treat when aphids appear and repeat at seven- to 10-day intervals, if needed. As an alternative, dinotefuran or imidacloprid can be applied as a drench around the root zone of aphid-infested plants and is systemically taken up by the root system for insect control (see Table 1 for specific products). As with all pesticides, read and follow all label directions and precautions.



Cottony maple leaf scale adults (*Pulvinaria acericola*) (Walsh and Riley, 1868)
Photos by Nancy Gregory, University of Delaware

Scale: Many scale species-including *Pulvinaria acericola*, *Pulvinaria innumerabilis* and *Melanaspis tenebricosa* are pests of maples. Scales are unusual insects in appearance. They are small and immobile, with no visible legs. Scales vary in appearance depending on age, sex and species. Some are flat and appear like scales stuck to a plant, while others appear like white cottony masses. They feed on sap by piercing the leaf, stem or branch with their mouthparts and sucking. Their feeding can weaken or kill branches. Heavily infested trees are stunted with small flowers and leaves. Leaves may yellow and drop early.

Like aphids, soft scales, such as *Pulvinaria spp.*, also excrete honeydew. The growth of the sooty mold fungus on the honeydew results in leaves that are dark grayish-black. Armored scales, such as *Melanaspis tenebricosa*, do not excrete honeydew, as they feed differently than the soft scales.

Prevention & Treatment: A combination of various natural enemies, including ladybird beetles (ladybugs) and parasitic wasps, usually keeps scales under control. In small trees with light infestations, scale can be scraped off or infested branches can be removed and destroyed. In a large tree, controlling scale chemically is not always practical. The size of the tree, the need for specialized equipment and the cost may prohibit this approach. Adult scales are relatively protected from insecticides by their waxy covering. Their immature forms, called crawlers, are susceptible, however. If it is determined that chemical control is necessary, the recommended chemicals include the following: cyfluthrin, lambda cyhalothrin, bifenthrin, permethrin or carbaryl. Apply materials when crawlers appear and repeat in 10 days. Soft scales can be controlled by soil drenches with dinotefuran or imidacloprid. Drench applications are best made in the spring. Dinotefuran may move into trees more quickly than imidacloprid for faster control. See Table 1 for specific products. As with all pesticides, read and follow all label instructions and precautions.

Gall Makers: Maples often develop irregular growths or swellings known as galls on their leaves. Gall development is a reaction by the leaf tissue to feeding or egg laying by various mites (such as *Vasates quadripedes* and *Vasates aceriscrumena*) and insects (such as *Acericecis ocellaris* and *Cecidomyia ocellaris*). Galls vary greatly in

appearance from wart-like bumps to spindle-shaped protrusions to felt-like patches on the leaf's surface. Each insect or mite produces its own distinctive gall shape. Often the distinctive shape allows for identification of the pest. Galls typically develop in spring at about the time that leaves are expanding. Once the gall forms, the pest is protected inside the structure. When homeowners see these growths on the leaves of their maples, they often become quite concerned. It is important to remember that while unsightly, they do not cause permanent injury to a tree.



Ocellate gall midge (*Acericecis ocellaris*)
Photo by Lacy L. Hyche

Prevention & Treatment: Since leaf galls do little, if any, long-term damage to the tree, control efforts are typically not needed or recommended. If a tree is small, the homeowner can handpick and destroy leaves before exit holes form to allow the release of the pest.



Granulate ambrosia beetle (*Xylosandrus crassiusculus*) larvae (Motschulsky, 1866)
Photo by Will Hudson, University of Georgia

Asian Ambrosia Beetles: Japanese maples are among the more common hosts of the Asian ambrosia beetle (*Xylosandrus crassiusculus*), with other hosts including styrax, ornamental cherry (especially Yoshino), pecan, peach, plum, dogwood, persimmon, sweetgum, magnolia, fig, Chinese elm and azalea. This pest is attracted not only to damaged, stressed or transplanted trees, but to seemingly healthy trees as well. The beetle becomes active in early March (or earlier), and the female beetles bore into trunks or branch wood of thin-barked hardwood trees. Once a tree has been attacked, it becomes more attractive to further attack. Often these trees are less than four inches in diameter.



Granulate ambrosia beetle frass
G.Keith Douce, University of Georgia, Bugwwod.org

Visible symptoms include wilted foliage, as well as the toothpick-like strands of boring dust (frass) that protrude from these small, pencil-lead size holes. The Asian ambrosia beetle does not feed upon the

wood of the host, but instead carries with it an ambrosia fungus, which grows within the galleries made by the beetle. This fungus serves as a source of food, and may partially be responsible for the death of the host plant.

Prevention & Treatment: Heavily infested plants should be removed. If only a few branches are infested they may be cut out. The life cycle takes approximately 55 days until the emergence of the next generation of beetles, so prompt removal or burning of the wood is important. Protective sprays on other susceptible plants may reduce their spread. Permethrin may be used as a trunk and scaffold limb spray beginning in March (see Table 1 for specific products). Thoroughly wet the bark. Multiple treatments may be needed during a season. Research indicates that spraying the infested trunks with permethrin may cause the beetles to leave the galleries they have already created. Since the beetles do not consume the host plant material, dinotefuran and imidacloprid treatments are ineffective.

Other Problems

Girdling Roots: If a tree shows symptoms of poor vigor such as small leaves, death of small limbs, top dieback or leaf scorch, the condition could be due to girdling roots. This problem occurs when a root entwines around another large root or the base of the tree and prevents or hinders water and nutrient movement. Often girdling roots occur below ground level, indicated by a lack of root flare at the base of the trunk.

Prevention & Treatment: The portion of the root that is girdling the tree should be removed. The open wound can be treated with wound paint prior to covering with soil. Fertilization of the tree after root removal will aid in recovery.

Table 1. Insecticides & Fungicides for Maple Insect Pest & Disease Control.

Insecticides & Fungicides	Examples of Brand Names & Products
Acephate ¹	Bonide Systemic Insect Control Ortho Japanese Beetle Killer Concentrate
Carbaryl	Garden Tech Sevin Bug Killer Concentrate Ferti-lome Liquid Carbaryl Garden Spray
Chlorothalonil	Ortho Garden Disease Control Hi-Yield Vegetable Flower Fruit & Ornamental Fungicide Bonide Fungonil Concentrate

	Southern Ag Liquid Ornamental & Vegetable Fungicide Tiger Brand Daconil
Copper-based Fungicides	Bonide Liquid Copper Concentrate Camelot Fungicide/ Bactericide Concentrate Natural Guard Copper Soap Liquid Fungicide Concentrate
Cyfluthrin	Bayer Advanced Garden Power Force Multi Insect Killer Concentrate
Dinotefuran	Green Light Tree & Shrub Insect Control with Safari Insecticide
Horticultural Oil ²	Bonide All Seasons Spray Oil Concentrate Ferti-lome Horticultural Oil Spray Concentrate Lily Miller Superior Type Spray Oil Concentrate Southern Ag Parafine Horticultural Oil
Imidacloprid	Bayer Advanced 12 Month Tree & Shrub Insect Control (Drench) Bonide Annual Tree & Shrub Insect Control Ferti-lome Tree & Shrub Systemic Insect Drench
Insecticidal Soap ³	Bonide Multi-Purpose Insect Control Soap Concentrate Safer Rose & Flower Insect Killer Concentrate
Lambda Cyhalothrin	Spectracide Triazicide Once & Done Insect Killer Concentrate
Mancozeb	Bonide Mancozeb Flowable Southern Ag Dithane M-45
Malathion ⁴	Tiger Brand 50% Malathion Hi-Yield 55% Malathion Insect Spray Ortho Malathion Plus Insect Spray Concentrate Southern Ag Malathion 50% EC Spectracide Malathion Insect Spray Concentrate
Neem Oil ⁵	Ferti-lome Rose, Flower & Vegetable Spray Concentrate Ferti-lome Triple Action Plus: Neem Oil Concentrate Garden Safe Fungicide 3 Concentrate Green Light Rose Defense Concentrate Green Light Neem Concentrate Southern Ag Triple Action Neem Oil
Permethrin	Bonide Eight Insect Control Vegetable Fruit & Flower Concentrate Bonide Borer-Miner Killer Concentrate Hi-Yield Kill-A-Bug II Concentrate Southern Ag Permetrol Rose Flower Fruit & Vegetable Insecticide Concentrate
Pyrethrin	Bonide Garden Insect Spray Concentrate Spectracide Garden Insect Killer Concentrate Southern Ag Natural Pyrethrin Concentrate
Thiophanate-methyl	Cleary's 3336-WP Turf & Ornamental Fungicide Ferti-lome Halt Systemic Fungicide Southern Ag Thiomyl Systemic Fungicide

Important Notes: Chemical control of diseases and insect pests by sprays on large trees is usually not feasible since adequate coverage of the foliage with a pesticide cannot be achieved.

¹Acephate may damage red and sugar maples.

²Horticultural oil may injure Japanese, amur and red maples. May not injure silver maple.

³Insecticidal soap should not be applied to Japanese maples.

⁴Malathion may cause slight injury to many maple species.

⁵Neem oil may cause injury to Japanese maples.

Follow label directions for all insecticide rates (strength in solution).

Do not apply insecticidal soap, horticultural oil, or neem oil if temperature is greater than 85 °F., and apply these three insecticides in early morning or evening.

Pesticides revised by Joey Williamson, HGIC Horticulture Extension Agent, Clemson University, 06/13. Revised by Joey Williamson, HGIC Horticulture Extension Agent, Clemson University, 11/09. Revised by authors, affiliation, 05/07. Originally prepared by Marjan Kluepfel, HGIC Horticulture Information Specialist; J. McLeod Scott, HGIC Horticulture Extension Agent; James H. Blake, HGIC Extension Plant Pathologist; and Clyde S. Gorsuch, Extension Entomologist (Emeritus), Clemson University, New 01/01.

This information is supplied with the understanding that no discrimination is intended and no endorsement by the Clemson University Cooperative Extension Service is implied. All recommendations are for South Carolina conditions and may not apply to other areas. Use pesticides only according to the directions on the label. All recommendations for pesticide use are for South Carolina only and were legal at the time of publication, but the status of registration and use patterns are subject to change by action of state and federal regulatory agencies. Follow all directions, precautions and restrictions that are listed.