

General Care of Maples: Managing *Phyllosticta* Leaf Spot Disease

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Phyllosticta leaf spot is infesting maples (*Acer* spp.) in Washoe County, specifically Amur maples (Figure 1). It may exist elsewhere in Nevada where maples grow. The fungus, *Phyllosticta minima*, causes spotting on leaves of many maples including: Amur, hedge, Japanese, mountain, red, silver, sugar, sycamore, and tatarian maples.



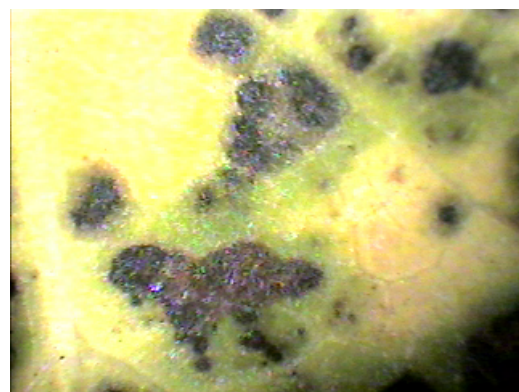
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Figure 1. Leaf spots on an Amur maple leaf from *Phyllosticta minima*.

Symptoms

Phyllosticta leaf spot symptoms range from a few round spots or lesions (Figure 2) that do not affect the overall tree, to early loss of leaves by mid to late summer from a

severe infestation that, overtime, can debilitate the tree (Figure 3). The irregular, round, yellowish brown lesions are usually less than 5 mm ($\frac{3}{16}$ inch) in diameter. Under the right conditions, tiny black fruiting bodies of the pathogen (which can be seen with a hand lens or microscope) are produced, usually they form a circle. The center of these spots is dead tissue that easily breaks away leaving a hole.



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Figure 2. Close-up of black leaf spots and lesions caused by *Phyllosticta minima*.

Disease Cycle

Wet weather in spring and early summer in successive years contributes to infectious development and growth of *Phyllosticta*

minima leaf spots. Infection occurs on wet leaves by water-splashed spores. Black fruiting structures (pycnidia) develop in the center of the spots. Infection is most severe in the lower third of the tree, where there is more moisture, as well as on soft tissues of newly emerging leaves. A severe infestation of this *Phyllosticta* species kills a large portion of the leaves (Figure 4) which leads to premature leaf loss. Disease is usually most prevalent on red, silver, and sugar maple species.

- Avoiding overhead irrigation. If it is necessary to use overhead irrigation, water when foliage can dry quickly.
- Spraying the tree, when necessary, with appropriately labeled fungicides to curtail or prevent further disease spread. Fungicide sprays may be used to control diseases of trees with a history of the disease. Fungicides must be applied before or during the early stages of infection, in early spring and summer, to obtain the best results. Fungicides act as protectants. Little control can be expected after symptoms develop. If fungicides are necessary, use a product containing mancozeb (Dithane) or chlorothalonil (Bravo, Daconil).
- Removing, as a last resort, heavily infested branches to reduce the number of spores available to infest nearby healthy foliage.



Figure 3. Flagging, leaf loss, and general tree damage from *Phyllosticta* leaf spot.

Disease Management

There are many strategies to minimize or eliminate damage from this disease. These include:

- Removing and destroying leaves from trees infected with leaf spot disease prevents fungal pathogens from overwintering in fallen leaves on the ground.
- Maintaining uniform soil moisture by regularly irrigating. Mulch around young trees to prevent stress.



Figure 4. *Phyllosticta minima* leaf damage on an Amur maple.

General Care for Maples

Plant healthy maple trees in well-drained soil. The type of soil determines how much nutrients and water are available to the tree, as well as how efficiently the tree can use those nutrients. For example, roots in poorly drained soils may not absorb

nutrients well and the nutrients in well-drained, sandy soils may be leached away from the roots. This determines how well your tree will be able to grow and fight diseases, like *Phyllosticta minima*.

Tree Selection: Select maples and their cultivars from the nursery that are adapted to the planting site. Inspect their roots, shoots and leaves (Figure 5) to ensure they are vigorous, uninfested by insects and disease free.



Figure 5. Healthy Amur maple leaves.

Watering: Large maples take a lot of water and nutrients from the soil because of their extensive fibrous root systems. They grow best when the supply of water is uniformly available, without periods of stress from under or over watering. It is important to expand the irrigated area around the tree yearly and to deeply water periodically. This keeps the roots expanding into new volumes of soil which improves the potential for more nutrient uptake and eliminates the potential for water stress during the summer.

Fertilizer Application: Use $\frac{3}{4}$ to 1 pound of actual nitrogen per 1000 feet squared from a complete fertilizer around each maple tree to promote root development, disease resistance, growth, and long-term soil health. A fertilizer containing all three elements, nitrogen, phosphorus and potassium, is a complete fertilizer. Divide the first number on the fertilizer bag into 100 to determine the number of pounds of fertilizer equal to one pound of actual nitrogen. For example, 5 pounds of a 20-

10-15 fertilizer equals 1 pound of actual nitrogen. Apply a fast-release form of fertilizer in spring (two weeks before bud break) or in late fall (after the tree has lost its leaves, but before the ground has frozen—usually in late October or early November) and irrigate well to move the fertilizer into the root zone so the tree can absorb it. Do not apply fertilizers in summer, especially without irrigation available, as this increases stresses on trees. In Nevada, it is often important to supplement the soil with sulfur to lower the pH, as well as iron and zinc to reduce deficiencies of these elements in the tree. Iron and zinc deficiencies cause poor growth and chlorotic leaves (yellow leaves with green veins). Apply these according to the label directions on the product.

Pruning: Young maples should be trained to a single leader (trunk) with limbs radiating out in all directions. Medium and large maples need very little pruning; however, small maples should be pruned to emphasize their natural shape (Figure 6). In areas with mild winters, cuts should be made in summer or early fall. In places where winter temperatures are constantly below freezing, cuts should be made from summer to the end of January. Avoid late spring pruning of maples as they often ooze sap all summer long when pruned at this time.



Figure 6. Healthy Amur maples have a naturally rounded form.

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