

# Leaf Scorch

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*In this fact sheet, learn how to minimize and alleviate leaf scorch by identifying environmental, chemical and mechanical conditions in which this common problem occurs.*

## What is leaf scorch?

Leaf scorch is a physiological disorder that presents as discolored tissues on the margins and sometimes between the veins of tree and shrub leaves (Fig. 1). In severe cases the whole leaf turns brown, shrivels up and drops off. Leaf scorch is, in fact, a reaction to an unfavorable environment. Though there might be multiple reasons for this condition, scorch is most often a direct result of an inadequate water supply.



*Figure 1: Early scorch symptoms on maple.*

## Causes of leaf scorch

Water movement through a plant occurs within its vascular system, beginning with the fine feeder roots, then traveling through the trunk, limbs, and branches, before ending up in the leaves. Anything that would disrupt this water movement can cause leaf scorch.

## Root problems

Girdling roots can restrict water movement (Fig. 2). Girdling occurs when there is not enough room for roots to develop. Best example: when the roots of a container-grown plant hit the container wall, they bend and start growing following the shape of the container. The end result is roots growing in a circular motion that cross over, intertwine and, if left alone, create a major problem. To prevent and/or reduce the possibility of girdling root development, the following procedure is recommended:

- Prune the roots on bare-root trees and/or shrubs before planting, removing damaged roots, cutting through twisted roots and roots that grow in a circular direction.
- For container-grown trees, on all four sides of the root ball make 2-inch-deep cuts all the way down the ball to interrupt the established circular direction of the root growth and allow for new roots to spread out (Fig. 2).



*Figure 2. Preventing girdling root formation in container-grown trees and/or shrubs.*

Improper planting procedures can lead to severe transplant shock:

- Digging a planting hole that is too small to accommodate the roots and/or root ball creates the same problem as the girdled roots of container grown plants.
- Leaving burlap, wire cages, or plastic twine around the planted root ball damages roots:
  - Burlap will act as a wick, pulling the moisture away from the roots, causing them to dry out and ultimately die.
  - Wire cages will eventually cause twisting of the roots, leading to girdling.
  - Plastic twine can cause girdling that leads to dieback of limbs above the girdling twine.
- Planting a root ball too deep leads to root suffocation.

Construction can cause root damage and interrupt water movement:

- Part of the root system gets damaged and/or removed.
- Changing the grade by putting more than 4 inches of soil around the base of a trunk will lead to root decline and suffocation.

Erosion can wash away soil, leaving roots exposed.

Improper watering – both inadequate and excessive water – will result in the same scorched-leaf symptoms:

- Inadequate water can be due to:
  - Infrequent watering, inadequate amounts/volumes of water.
  - Poor location of a tree or a shrub (in a parking lot, by a driveway and/or street) where there is limited if any green surface around the tree to soak up the rain and keep a healthy environment for root development.
- Excessive moisture will create anaerobic conditions (water will push out and replace oxygen from the pores in the soil) that are not conducive to new root development, resulting in water deprivation and scorching symptoms on the leaves.

Excessive fertilization can be detrimental to a plant; fertilizers are salts and will pull moisture away from the tissues, leaving them dry or burned and unable to function.



## Problems on trunks, limbs and branches

## Leaf problems

## Prevention or treatment

Winter damage can injure or destroy roots:

- Salt from road treatment runoff can damage roots.
  - Cold temperatures can kill roots within the frost zone.
- High winds will draw moisture out of plant tissues drying them out.

Mechanical injury (mower injury, weed eater injury, etc.)

Frost and/or winter injury (bark splitting, dieback, etc.) (Fig. 3)

Girdling with twines and wires (tags, staking wires, etc.) (Fig.4)

Herbicide injury (tissue burns from excessive, off-target or drift spray of chemicals)

Disease injury (cankers, vascular wilts, etc.) (Fig. 5)

Environmental conditions

- High temperatures/heat stress
  - Direct exposure to the sun
  - Radiation/reflective heat (driveway, street, parking lot, walls, etc.) (Fig. 6.)
- High winds leading to desiccation (drying out) and scorch symptoms

Chemical burn due to improper use of pesticides or fertilizers

Prevention is the best approach to managing leaf scorch. Besides the obvious precautions of avoiding husbandry mistakes and mechanical injuries (from any source to any plant structure), the best way to address leaf scorch problems is to prevent stresses induced by environmental and plant health issues. Though we cannot control climate, there are a few things we can do to help plants overcome the negative effects of exposure to extreme temperatures.

**Figure 5**



*Canker (Black rot) – apple.*



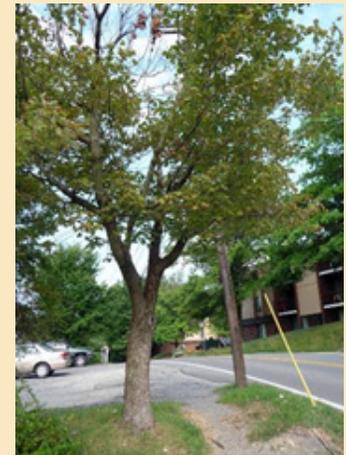
*Black knot on plum.*



*Bacterial canker on cherry.*



*Verticillium on maple.*



**Figure 6.** Reflective heat, girdling roots, construction injury.



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## Fertilization

Fertilization will improve the overall vigor and health of plants. It is important to choose the right fertilizer formulation as well as the proper timing for fertilizer application. For example:

- Adequate levels of phosphorus would improve a plant's tolerance to cold temperatures.
- Adequate levels of potassium provide building blocks for thicker cell walls, making plants more resistant to insect and disease attacks.
- Fertilizers with high concentrations of nitrogen applied late in a season will prolong plant growth and postpone wood hardening, making tissues more prone to frost and/or winter injury.

## Protection

Keeping injury from pests to a minimum results in stronger, healthier plants better able to withstand environmental stresses beyond human control (drought, flood, temperature extremes, etc.). Deep and less frequent watering in summer will promote the development of deep roots capable of better handling occasional drought conditions. In order to prevent winter desiccation, soak your landscape with a deep watering in the fall. This water within the soil profile will be available to the roots as long as the soil does not freeze. Plants that enter the winter moisture-deprived will be more prone to winter scorching and injury.

## For more information

*Last updated May 2015*

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AG15-114