



## Maple Decline

Maple decline affects primarily sugar maple (*Acer saccharum*), Norway maple (*A. platanoides*) and red maple (*A. rubrum*) in the Northeast. The problem is not a new one. Reports of maple decline have increased markedly in recent years to include urban, suburban, forest environments and sugarbush (sugar maple stands used for tapping).

### Predisposing Stresses

Stress factors for urban and suburban sites include drought, de-icing salts and winter injury. Compacted soil, excess mulch, grade changes and trenching for utility installation or repair are common causes of root injury. Home, road, sidewalk, patio and pool construction also cause root decline. Any injury is a route for the entry of wood decay organisms. Pruning and other wounds facilitate invasion by secondary organisms that greatly reduce the chances of recovery from the original stress. If these conditions are preceded or followed by insect defoliations, then the result could be the death of the stressed tree.

In forests, maples begin to decline after several successive years of drought and/or defoliation by insects. If affected trees lose their first set of leaves to insects they will often use up valuable food reserves to produce a second set. During and after refoliation, chemical changes occur in the trees that increase susceptibility to secondary diseases. *Armillaria mellea* (root rot), *Nectria cinnabarina* (branch canker) and *Steganosporium ovatum* (twig blight) are three fungi that frequently attack and may kill trees weakened by defoliation and refoliation. Trees that shut down due to drought are also vulnerable.

In sugarbushes, predisposing stresses also include heavy grazing, over-tapping and/or heavy traffic by farm machinery.

The sequence of events is similar for trees in any environment. Healthy trees are stressed repeatedly; the stress alters the trees' internal chemistry to allow repeated attack by secondary organisms and the trees ultimately die.

### Symptoms

**Reduced Twig Growth:** Yearly twig growth varies considerably between trees and even within the canopies of individual trees. Young trees may grow 12 to 24 inches in a season. Older trees may grow substantially more slowly. Examine the distance from bud scar to bud scar (where there is a ring of ridges around the smooth bark of a twig) on a non-shaded twig. If this is less than or equal to two inches on a standard size tree, then the tree is in trouble.

**Reduced foliage size and growth:** Keep in mind the normal, healthy appearance of your particular maple. Foliage that is sparse, light green and/or scorched signals that the tree could be declining.

**Dead branches** in the upper canopy are another sign of trouble. Small branches die first, followed by larger, more visible limbs.

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**Poor root conditions:** Look for dead, brittle and decaying older roots. Pay special attention to the buttress (root flare) area. The small “feeder” roots on a healthy tree are dense, particularly at the drip line (where the branches end). Declining trees will have few of these small roots.

**Early fall coloration:** When fall color develops more than a month earlier than all similar or different tree species on the site, the maple is definitely suffering from decline.

## **Management**

There is no spray or “cure” for maple decline, but you may be able to prolong the life of the tree with proper cultural practices. Treatment for maples in early decline includes watering, pruning damaged branches and reducing salt-laden spring runoff, if possible.

Water trees deeply with a soaker hose or a slow stream from a garden hose every week or two during dry weather. Move the hose periodically to moisten the entire soil area under the tree canopy to a depth of six or more inches. Do not over-water as this may encourage root rot.

A two inch layer of mulch that extends to the dripline will help to retain soil moisture and keep soil temperatures even. Keep mulch away from the trunk to prevent rot.

Fertilizing may not help if the root system is compromised and cannot absorb the nutrients effectively. We know from years of nutrient analyses that Rockland County soils tend to contain sufficient levels of nutrients. A nutrient analysis will measure the levels of nutrients in the soil, but cannot tell if those nutrients have been absorbed by the plant. Fertilizer that remains in the soil may burn roots when a tree cannot take up nutrients efficiently.

Dead branches should be removed whenever they are noticed. The best time to prune live material is in late winter or early spring when the tree has broken dormancy – trees that are actively growing are better able to react to wounding and resist disease. Sap running caused by spring pruning may be a nuisance, but will not harm the tree.

Road salt impact may be reduced by placing a barrier such as a curb, berm or ditch to divert salt-laden runoff. Take care to avoid root damage that results from grade changes or other barriers.

Often by the time decline symptoms are noticed, the tree may be past saving. In this case, another type of tree should be planted, if a replacement is desired, after the maple is removed. The success of treatment of declining maples depends primarily on early detection, the health of the tree and its ability to respond. Positive diagnosis will often depend on examination at the site by a professional arborist.

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