CCE SUFFOLK 1972-2022 50 YEARS
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Maple Decline

Introduction

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; stagheaded maples were described as early as 1917 in Massachusetts. At that time, dieback was attributed mainly to drought and to the poor conditions for tree growth afforded by the urban environment. However, reports of the incidence and severity of maple decline have increased markedly in recent years to include urban, sugarbush, and forest environments.

In forests, maples usually begin decline after several successive years of defoliation by insects. Affected trees not only lose their first set of leaves to these insects, but will often use up valuable food reserves to produce a second set. During and after "refoliation", chemical changes occur in the tree that increases its susceptibility to secondary pathogens. *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.

In sugarbushes, predisposing stresses include drought, heavy grazing, over-tapping, and/or heavy traffic by farm machinery. Seriously affected trees are often over-mature and have been heavily tapped for many years. Tapping holes, animal-damaged roots, and machine-damaged roots are all routes for entry of wood decay organisms. If this scenario is followed by insect defoliation as previously described, the result is often mortality of the stressed trees.

In urban sites principal stress factors in maple decline include drought, de-icing salts and/or road and sidewalk construction. These stresses also facilitate invasion by secondary organisms including root rots, decays and twig blights which greatly reduce chances of recovery from original stress(es). No matter which of the three environments maple decline occurs in, the sequence of events is similar. Healthy trees are stressed repeatedly, the stresses alter the tree's internal chemistry to allow repeated attack by secondary organisms, and the trees ultimately die.

Symptoms

1. Reduced twig growth. Yearly twig growth varies considerably between trees and even within the canopies of individual trees. If the distance from bud scar to bud scar is less than or equal to five cm on a non-shaded twig, the tree may be in trouble.

2. Reduced foliage growth. Keep in mind the normal, healthy appearance of the particular maple species' foliage. Foliage that is sparse, light green and/or scorched signals that the tree may be declining.

3. Early fall coloration. Maples normally begin showing fall color after the first frost or in mid-to-late September. When fall color develops earlier than normal, in late July or early August, the maple is suffering from decline.

4. Dead branches in upper canopy. Small dead branches seen in tree tops in late spring or early summer are indicative of decline. Over time, larger, more visible branches and limbs will dieback. The more numerous the dead twigs or branches are, the more severe the decline condition.

5. Poor root condition. If roots can be examined, look for reduced occurrence of small feeder rootlets; dead, brittle roots; and decaying buttress roots.

Control Strategies

Treatment for declining urban maples includes watering, fertilizing, pruning dead branches, and reducing salt-laden spring water runoff over the roots. Thoroughly water trees every week or two during extended dry weather. Trees should be watered with a slow stream from a hose. Move the hose periodically to soak the entire soil area under the tree's branches to a depth of six or more inches. Fertilize trees with a complete fertilizer in the spring and/or late fall. The general recommendation is 2 to 4 lbs fertilizer per inch of tree diameter (0.35 to 0.7 kg per cm of tree diameter at 1.5 m above ground). Broadcast the fertilizer over the surface of the ground. Some risk of burn on nearby turf may occur at the higher rates. Prune dead branches as well to possibly stimulate renewed, vigorous shoot growth. Pruning is best done in the early spring, prior to budbreak, to promote healing of the pruning cuts. Road salt impact can be reduced by placing a barrier (curb, berm, ditch, etc.) which will catch and/or divert the spring runoff water which often contains copious amounts of salt. If soil and foliar analyses have been run and high sodium or chloride concentrations were found, then leaching the soil with fresh water or applying gypsum to improve the soil structure or texture may be useful.

By the time symptoms are noticed, the tree may be beyond being restored to its original splendor. However, at this time another tree may be planted which will eventually replace the declining maple. In this way the newly planted tree will have a few years to grow prior to the removal of the declining maple. Plant young maple trees away from roads to avoid de-icing salt problems.

The success of treatment to declining maples depends primarily on early detection of maple decline, the health of the tree prior to treatment, and/or its ability to respond to treatment. Positive diagnosis will often depend on "on the spot" examination or the amount of information obtainable from the person submitting a sample. However, the prescribed treatments of fertilizing, watering and pruning will not damage healthy trees.

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