

PLANT HEALTH CARE REPORT



Mature Tree

A mature tree is in delicate balance with its environment. As a tree ages, most of the energy produced by the leaves each year is used to maintain existing tissues, defend against pests and disease, and reproduce (fruit and seed). Less energy is stored in reserve and a mature tree becomes less tolerant to stress and site changes. Mature trees have also been exposed to storms, wounding, environmental stress, and pests and diseases over a long time. Thus, wood decay, root disorders, and other structural deficiencies that increase the risk of failures will be ongoing management concerns.



Mature
elm on
popular
vacation
site



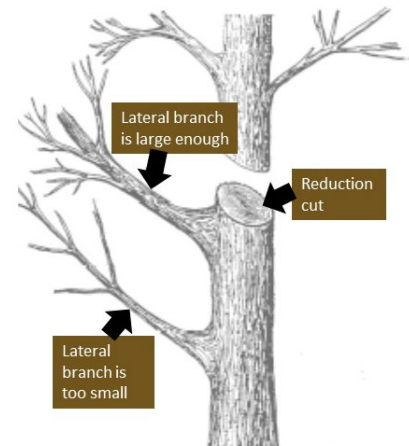
Mature
eastern red
cedar with
limited
rooting
space

Inspecting mature trees periodically for structural defects, including broken branches, cracks, split unions, decay, and root defects is essential to identify sources of failure that could lead to personal injury or property damage. Inspections can also reveal early symptoms of stress, including insect and disease problems, which can be corrected before decline occurs. Thorough inspections should be performed at least annually and after major storms.

Pruning goals for a mature tree may vary; reducing the risk of failure, improving health by increasing light and air penetration, and reducing density are common. Since pruning carries a cost to the tree by producing wounds and reducing leaf surface area, the tree parts and amounts to be pruned should be evaluated and specified. For the vast majority of mature trees, removing dead, dying, diseased, broken, and crossing branches is sufficient.

If reducing branch density, removal and reduction cuts should be concentrated on branch ends. This will improve light and air penetration and reduce the weight on the portion of the branch most likely to break. Some tree workers strip interior portions of the crown, but this practice reduces the tree's potential to photosynthesize, promotes growth at branch ends, and reduces branch taper, increasing the frequency of branch failure during storms. Routine live-branch removal does not benefit the tree; in mature trees, no more than 25% of the live crown should be removed during any single operation.

Reducing the crown size is not a preferred goal and should only be undertaken when necessary to remove or reduce branches that interfere with buildings, traffic, utilities, security lights, or other structures; correct storm damage; or correct structural defects. When reducing the crown, branches should be cut back to lateral branches that are at least $\frac{1}{3}$ the diameter of the cut to reduce the risk of dieback. Cabling and bracing are preferable alternatives to crown reduction in some cases.



A mature tree growing in a lawn or confined areas without fertilization or natural leaf decay can deplete the soil of some elements, reducing the life expectancy of the tree. Landscape soils are frequently disturbed, lack organic matter, and are inherently low in nutrient content. Competition with turf for nutrients can also contribute to deficiencies in trees.

Fertilizing can prevent nutrient deficiencies. Soil testing is recommended to provide information necessary to detect and prevent nutrient-related stresses. In many instances soil pH must be adjusted to ensure nutrient availability. Secondary and micronutrient deficiencies also are common in landscape trees and should be treated.

Root system care is critical to preventing moisture problems and root loss due to damage. During periods of moisture stress, stomata in leaves close to reduce water loss from transpiration. This response reduces water needs but inhibits photosynthesis. Trees survive droughts largely on stored reserves. Irrigation is important to prevent moisture stress during droughts. In most areas, trees require 1" of irrigation water per week during the growing season when rainfall does not occur. This is equivalent to 625 gallons of water per 1,000 square feet of root zone. Irrigation water can be supplied gradually using a drip system or applied in 1 or 2 applications per week. Saturated soil due to overwatering can promote

root disease and root death. Tensiometers can be installed in the root zone to help assess the need for irrigation.

Compacted soils physically resist root growth, reduce soil oxygen levels, and inhibit water retention—all of which can lead to root death. Several aeration treatments are available depending on the soil, tree, and extent of compaction. These treatments can incorporate organic matter, biochar, fertilizer, pH adjusters and beneficial fungal associations (mycorrhizae) in the soil.

Mulching trees is highly effective for improving the soil environment for root growth. Mulch moderates soil temperatures, conserves soil moisture, provides organic material and provides a buffer against compaction. A 2–4” depth over the root zone is optimal. Some benefit will be derived from smaller rings of mulch, but since roots extend beyond the dripline, wider is best. Mulch and soil should not be allowed to accumulate against the stem.



Root loss is the most common inciting factor to premature decline and death of landscape trees. This may be the result of physical injury such as construction, compaction, installation of underground utilities, or sidewalk repair. However, hidden factors such as root disease, excessive soil moisture from grade changes, or competition with turf for water and nutrients can cause root loss.

Integrated pest management (IPM) principles should be used to manage pests and disease that weaken mature trees by defoliating them or causing stem and root damage. IPM is a technique of periodically inspecting plants for pests and other plant health problems. When detected, pests are maintained below levels which impact plant health through cultural, biological, or chemical treatments.

Maintaining a stable environment around the tree is critical in delaying the transition from maturity to decline and death. Treatments should be applied preventively to maintain plant health and structure rather than remedially once decline begins. Cultural practices of pruning, fertilization, root system care, and pest management can improve the structure and increase the longevity of mature trees.