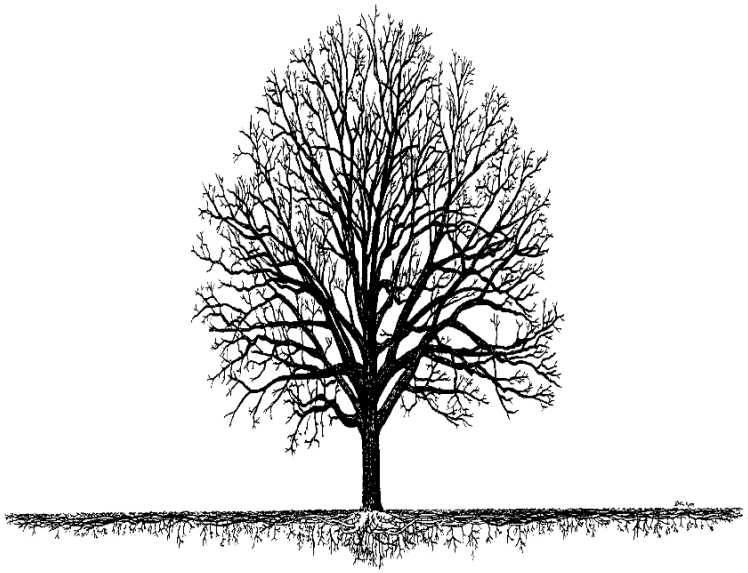
BARTLETT TREE EXPERTS
SCIENTIFIC TREE CARE SINCE 1907



# *Plant Health Care Recommendations for Mature Trees*

As trees age and grow in size, most of the energy produced by the leaves each year is used to maintain existing tissues, for defense against insects and disease pests and for reproduction (fruit and seed). Growth of mature plants slows dramatically because less energy is available for this process. Stored energy reserves are minimal compared to young plants. Mature trees are relatively intolerant of stress and site changes. They are in a delicate balance with their environment.



Mature trees also have been exposed to storms, wounding, environmental stress and insect and disease pests over a long time period. Subsequently, wood decay, root disorders and other structural deficiencies which increase the risk of failures are major management concerns.

Maintaining a **stable environment** around old trees is critical in delaying the transition from maturity to decline and death. Inspecting, evaluating and treating mature trees for structural deficiencies which pose an unreasonable risk of failure is another important management consideration. Management programs must be proactive rather than reactive. Treatments should be applied preventatively to maintain plant health and structure rather than remedial once decline begins. Properly performed cultural practices including pruning, fertilization, pest management and root system care can increase the longevity and help maintain the structure of mature trees.

Periodically **inspecting** mature trees for structural defects, including dead and broken limbs, cracks, split crotches, decay and root defects, is essential to reduce the risk of failures that

could lead to personal injury or property damage. Inspections can also reveal early symptoms of stress and insect and disease pests which may be corrected before decline occurs. Thorough inspections should be performed at least annually and after major storms.

**Pruning** mature trees must be done judiciously. Severe pruning reduces leaf surface area and produces numerous wounds which creates an energy deficit. Pruning should be focused on removing dead, dying, diseased, broken and crossing/rubbing branches. For the vast majority of mature trees only **crown cleaning** should be specified.

Selective thinning should be performed only when necessary if the crown is very dense. No more than twenty percent of the live crown should be removed during any single operation. Selective thinning should be concentrated on branch ends. This will improve light and air penetration and reduces the weight of that portion of the branch which is most prone to breakage. Some arborists thin trees by stripping interior portions of the crown. This technique promotes growth at branch ends and reduces branch taper, which actually increases the frequency of limb failure during storms. Specifications for pruning require that at least one half of the branches should be left on the lower two thirds of a leader in order to encourage taper and reduce risk of breakage.
Crown reduction pruning should be undertaken only when necessary to eliminate branches which interfere with buildings, traffic flow, utilities, security lights or other structures. Crown reduction pruning may also be necessary to correct storm damage or structural defects.

**Cabling and bracing** is a preferable alternative to crown reduction in some cases. Crown reduction pruning should be considered as a necessity rather than a preferred maintenance option. When crown reduction is performed, limbs should be cut back to laterals which are at least one third the diameter of the cut to reduce the risk of dieback.

Mature trees growing in lawn or confined areas without fertilization or nutrient cycling can deplete the soil of some elements. Decades of nutrient absorption without any significant replacement will leave soil depleted and reduce the life expectancy of the tree. Landscape soils frequently are disturbed, lack organic matter and are inherently low in nutrient content. Competition with turf for nutrients also can contribute to deficiencies in trees.

**Soil testing** is recommended to provide information necessary to detect and prevent nutrient related stresses. Preventing nutrient deficiencies can be easily accomplished by periodic **fertilization**. In many instances **soil pH** must be adjusted to ensure nutrient availability. Secondary and micro-nutrient deficiencies also are common in landscape trees and should be treated.

During periods of moisture stress, stomates 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 of the United States, trees demand one inch of irrigation water per week during the growing season when rainfall does not occur.

This is equivalent to 700 gallons of water per thousand square feet of root zone. Irrigation water can be supplied gradually using a drip system or applied in one or two applications per week. **Tensiometers** can be installed to in the root zone to help assess the need for irrigation. Over irrigation can cause root rot infections and root suffocation.

**Insect and disease pests** weaken trees by defoliation and by causing stem and root damage. Pests should be managed using integrated pest management (**IPM**) principles. 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 and/or chemical treatments.

**Root loss** is the most common inciting factor to premature decline and death of landscape trees. It occurs from many causes, including construction, compaction, installation of underground utilities, sidewalk repair, and root disease pathogens. Excessive soil moisture from irrigation or grade changes also cause root loss or inhibit root development. Turf roots will suppress growth of tree roots and compete for water and nutrients.

**Compacted soils** impose a physical resistance to root growth**,** reduce soil oxygen levels and inhibits water retention all of which can lead to root mortality. Several aeration treatments are available depending on the soils, tree and extent of compaction. A certified arborist should be consulted to develop treatments for the specific site.

**Mulching** trees is highly effective for improving the soil environment for root growth. Mulches moderate soil temperatures, conserve soil moisture, provide organic material and provide a buffer against compaction. Mulch in lieu of turf eliminates competition for water and nutrients between turf and trees. A two-to-four inch depth over the root zone is optimal. Some benefit will be derived from smaller rings of mulch closer to the stem. Mulches should not be allowed to accumulate against the stems of plants.

**Mycorrhizae** are symbiotic fungi which colonize the root system of trees. They promote water and nutrient uptake and reduce the ability of root rot fungi to infect the roots. Mycorrhizae can be inoculated on a mature tree's root system.