



Seasonal Tree Tips

During fall, it's very important to consider practices that improve the health of your soils. Please read about it in our article on Autumn Soil Health Care in this issue.

Now is the time to begin getting your plants ready for winter. Where snow and ice accumulation is a concern, evergreens may need to be wrapped in twine to prevent breakage and crown deformity. Evergreens with upright growth habits and multiple stems such as boxwood and arborvitae are most susceptible to this damage. Large trees with weakly attached branches may require pruning and installation of supplemental support cables to reduce the risk of failure, especially during severe weather.

Bartlett provides Shrub Coat® to help protect high value shrubs and small trees from severe winter weather and foraging animals. The coats create a tent to cover the plant, helping protect against breakage, damage from low temperatures and desiccation from winter winds. Covering plants with this sturdy, breathable fabric is the best protection for plant species prone to winter injuries.



Pest management does not stop with the growing season. Horticultural oils can be applied to broadleaf trees and shrubs in autumn to help suppress scales and other overwintering pests. Cool season spider mites begin activity on evergreens, especially conifers, with the onset of lower temperatures. Properly timed treatments that may include release of beneficial predaceous mites are important now. Deer will begin to establish their feeding patterns in fall as natural food sources become limited. Repellents should be applied early to deter foraging and encourage feeding patterns that do not include your landscape plants!

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So, fire up your PC, Mac or laptop and visit us often—because our new website is going to be updated frequently with useful information about the care of your trees and shrubs. Arboriculture is a fascinating and evolving science and we don't want you to miss a thing!



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Find your client code in the yellow box on the reply card included with *Tree Tips*. It looks like the sample below.

Then, go to the registration link and sign up. You can always return to mail service if you prefer a printed copy of *Tree Tips*.



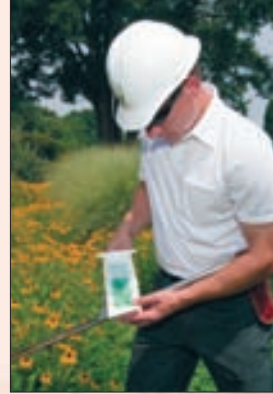
Autumn Soil Care

Now is an excellent time to focus on improving the health of soils in your landscape. Late summer and autumn is a peak period for fine root development in woody landscape plants and is also the preferred time to improve soil conditions to accommodate root growth. Nutrients applied to the soil now will be converted for absorption by actively growing plant roots. These nutrients are stored in the plant over the winter and are ready to support crown development next spring. Nitrogen in all of Bartlett's BOOST® fertilizer products is formulated to be released gradually during periods when soils are moist and relatively warm. So nitrogen that is not released in the fall remains in an insoluble form until spring when conversion to increased nutrient intake resumes. This maximizes the amount of nitrogen that ultimately reaches the plant and minimizes leaching and runoff. If you prefer to fertilize plants in spring or summer, have the soil analyzed for nutrient content and pH in autumn. If lime or sulfur is required to adjust pH, fall applications are ideal because these treatments alter soil chemistry slowly over time.

Fall is also ideal for mulching woody plants or top-dressing existing mulch beds. Mulches help moderate soil temperatures and conserve soil moisture. This is important for reduction of winter injury on evergreens and on less hardy species that are prone to low temperature injury. Mulches are generally applied after leaf-fall but before soil freezes in northern regions of the country.

If soils are disturbed, compacted or low in organic matter, they can be restored to better health through our patented Root Invigoration® process. Soils are loosened using an Air-Spade® and compost is then incorporated into the site. This process is very similar to roto-tilling a plant bed or garden, but existing plant roots are not damaged. Root Invigoration improves soil structure and creates an ideal root environment for existing plants. It is a perfect way to prepare soil for shade loving plants beneath a tree's canopy.

You can find out more about soil management techniques on our web site or by contacting your Bartlett Arborist Representative. ■



European Beech Decline New Research Confirms Causes and Validates Treatments

European beech is one of the most stately and highly prized landscape trees. These plants are relatively slow growing and large mature specimens are not readily replaced. While this tree can live hundreds of years in its native environment in Europe, the decline of European beech in this country is quite common on specimens that are 75–100 years old. Clearly the lifespan of this tree is much shorter in North America, probably due to extremes in temperature and moisture that occurs on this continent as compared to Europe.

Recent research at Cornell University has identified a major disease that is occurring on mature beech trees, accelerating their decline.

Research has confirmed our observations and validated treatment programs to extend the life span of the European beech.

Decline of mature trees is often initiated by bleeding lesions (cankers) caused by the microorganism *Phytophthora*. These lesions usually begin on the lower stem near the soil line and progress upward killing the bark and sapwood. Water movement to the crown is interrupted, causing branch dieback and decline. As trees become more stressed, secondary borers and bark beetles invade the stems and branches to accelerate decline and death of the plant. The Cornell research has shown that 40% of mature beech trees in the Northeast US exhibit symptoms of the bleeding lesion caused by *Phytophthora*.



Bleeding canker on beech

The Cornell research has identified three species of *Phytophthora* from bleeding lesions. *Phytophthora spp.*, a fungus-like organism causes root and stem diseases on a wide range of woody plants. Sudden Oak Death disease affecting oaks in many areas of California is also

caused by a *Phytophthora* that is similar to the beech pathogens. While we do not fully understand why and how *Phytophthora* infects beech stems, it is apparent that the disease is most prevalent on stressed trees, especially those stressed by moisture extremes (drought followed by high rainfall or irrigation).

Fortunately we have an effective treatment to reduce the risk of infection by *Phytophthora*. The treatment consists of a fungicide application to the bark on the lower stem of the tree in spring and again in fall. The treatment is translocated into the inner bark and sapwood to induce a resistant

response within the cells of these tissues. These treatments were developed in California for preventing Sudden Oak Death and have proven to be highly reliable against bleeding canker on beech. While it is intended to be a preventative treatment, we have experienced considerable success in treating trees in the early stages of disease.



Declining European copper beech

The fungicide treatment is being successfully used in conjunction with cultural practices to maintain plant vitality. Mulching the critical root zone of beech is extremely important to manage stress during drought and to eliminate competition with turf roots. When trees have been growing for years in turf, soil cultivation using an Air-Spade and organic matter incorporation will improve soil health and provide an excellent rooting environment. This Root Invigoration® process is also used on disturbed and compacted soils. Irrigation is important during

periods of dry weather and should be in the form of drip systems or soaker hoses to prevent water contact with the stem, decreasing the likelihood of bleeding canker disease. On mature trees, routine treatments to suppress borer infestations are critical to prevent decline. If you detect decline in any of the European beech on your property, contact your Bartlett Arborist Representative immediately. ■

Planting Trees from Containers

Many mature tree issues Arborists face in the field are a result of improper planting techniques. These issues include girdling roots, buried root collars and compromised structural root plates. At the Bartlett Tree Research Laboratories (BTRL), we have installed research plots to determine how best to manipulate container trees at planting time to minimize or avoid problems as trees mature.

In nursery containers, roots fill the growing media provided in the pot or box. Once roots reach the edge of this container, they often begin to circle or dive deeper along the space between the growing media and the container. If this situation is not corrected at planting, defects can compromise tree health and stability in later years. The problem is exacerbated, because large container trees may have multiple layers of defects



Girdling root limiting water and nutrient flow to crown



Mechanically disturbed root system ready for planting



Smaller container sizes were potted into larger containers without correcting circling roots, creating multiple layers of defects.

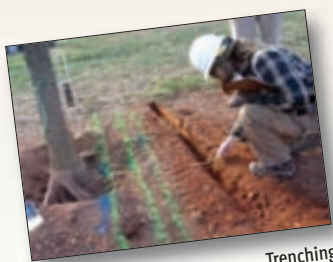
at each stage of production in the nursery. For example, a #15 container may have circling root defects at the #10 and #5 container sizes. This makes planting more difficult because we have to correct potential problems, not only on the outside of the root ball, but on the inside as well.

Studies conducted at BTRL and other institutions have shown that when root balls are “disturbed” to break or cut these circling (or diving) roots, there will likely be a reduction in tree health and growth for one

to three seasons after planting as compared to trees that were planted directly into the soil without any root disturbance. Studies by other institutions have shown that after these first few years, trees with disturbed root systems begin to outperform those without disturbance. There are many differences in the methods and species used in all of the ongoing studies, but the trends are apparent. The clear message is that the short-term vigor of trees may be affected by root ball disturbance, but the long-term

health will be enhanced. Just how much should we disturb a root system and what methods are most successful? Which species respond well to this and which can't tolerate these methods? Questions like these will keep researchers busy for years to come so stay tuned... ■

Research Update on Root Stability



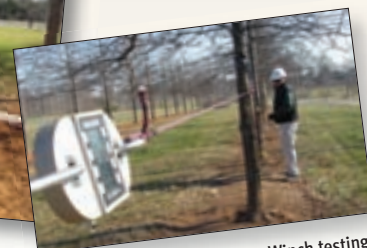
Trenching



Cutting roots



Measuring force



Winch testing

We are frequently posed with the question “How close to my tree can we trench without risking the health and stability of the tree?” This is often asked in regards to building an addition to a house, rerouting a driveway, installing underground utilities or replacing buckled sidewalks. It is well known that cutting roots too close to a tree will limit the water and nutrient uptake of the tree and reduce stability.

For the past several years the Bartlett Tree Research Laboratories has been studying the effects of root cuts on tree stability. Tests have been conducted on red maples and willow oaks. The procedure is fairly simple. We attach a digital level to the lower stem and install a rope in the upper crown. With a winch, we pull the tree to an angle of one degree. The force on the tree is recorded and we allow the tree to spring back to its original angle. After initially measuring the force necessary to

move the stem one degree, we start cutting the roots in straight lines perpendicular to normal root growth. After the trench is cut, we re-measure the force it takes to pull the tree to 10 and then do a second root cut closer to the trunk. This procedure is repeated multiple times until we shave the buttress roots off the tree at the trunk.

What we have found on these young study trees is that there is a measurable change in tree stability when cuts are made closer to the trunk than three times the trunk diameter. So, a 6 inch diameter tree is less stable when we cut the roots closer than 18 inches from the trunk. If the soil is relatively dry, it does not make any difference if we pull the trees from the side where the root cut was made or on the opposite side of the tree. However, if the soil is water saturated, the tree is much less stable when pulled on the side of the tree toward the cut roots.

We need to be more conservative when applying

our research results to larger trees. As trees age, root decay is more common, so older trees may be less stable initially. Mature trees are also more prone to root decay following an injury to the root system. Cutting roots at a distance of five times the trunk diameter should be better than cutting closer. This distance should also minimize infection by root decay fungi. The best place to cut tree roots is outside the dripline of the tree. At this distance there are many fine roots needed for water and nutrient uptake, but fewer roots needed for stability.

If you are planning to do any soil excavation near your trees it is best to contact your Arborist Representative first. There are often compounding factors that must be taken into consideration. More information and other tree research projects can be found at:

<http://www.isaarbor.com/members/joaSwitch.aspx>
Or, contact your Bartlett Arborist Representative. ■

ASK DR. BRUCE

Question:

I live in Spartanburg, SC and have a 25' live oak that was damaged in a late season snow storm. A major lower branch, occurring 5' from the base of the tree, was ripped from trunk. The resulting split carried away approximately one quarter of the trunk's diameter in a section about 3' long. Also, a 4' top section of the tree was broken out. Previously, the tree was a perfect live oak specimen with classic spreading lower branches. Now there is a significant void where the lower branch was lost. The top section change is not quite as obvious. The tree is situated in the middle of a very large bed of mature formosa azaleas that are regularly irrigated, fertilized and sprayed for pests, so it receives above average care. From your experience, do you think the tree will recover from the storm damage or will it simply be a matter of gradual decline? I have heard from friends that live oaks that were severely damaged by Hugo eventually recovered. This tree was a beauty, do you think there may be a chance of recovery? Will it naturally fill in the lost section? Or should I cut my loss, replace it and hope to live long enough to enjoy the new planting?

Paul McKee

Answer:

Live oaks have an incredible capacity to rebound from severe storm damage. Charlotte experienced a major ice storm in 2002 and large portions of a live oak in our arboretum were lost. More than 50% of the branches, including several large leaders, failed. Now, after six growing seasons, the tree looks respectable again. Without seeing your tree, I can't make definite recommendations. but I would be inclined to keep the tree and have a Certified Arborist prune it periodically to restructure the crown.

Dr. Bruce R. Fraedrich

Ginkgo biloba: One of a Kind

Ginkgo biloba is widely recognized as an excellent street tree. It survives under very harsh environmental conditions. Drought, de-icing salts and soil compaction that is caused by cars and pedestrians would cause many other different tree species to fail. The *Ginkgo biloba* typically grows into a very large tree, reaching a height of 60 to 75 feet. However, many narrow, upright selections, compact growers and some dwarf cultivars are becoming increasingly available to buy. Ginkgo is dioecious, meaning that male and female flowers are produced on separate plants. It is important to purchase only male selections because the fruit that is produced on female trees in late summer emits a very foul odor.

The tree has an angular crown and long, erratic branches. It produces deep growing roots that in turn make the tree very resilient to wind throw

(blowing over). Young trees are often tall and slender, and sparsely branched with the crown becoming broader as the tree ages. Autumn color is excellent as the leaves turn a bright yellow before falling off the tree. Leaves drop rapidly, often within a few days, giving the tree a reputation for being very "clean." Ginkgo transplants easily but is slow to recover and does not grow rapidly in the first few years following planting. With a powerful combination of resistance to disease and insect attack and tolerance to adverse environments, Ginkgo is a very long-lived tree species. This native of China is literally a "living fossil": its shape, form and growth habits have changed very little over the past 200 million years. *Ginkgo biloba* leaf extracts are commercially available to buy from health shops. Consumption of which is said to fight infections, improve short-term memory and even alleviate the early signs of dementia. ■



Poisonous Mulch, Pets and the Chocolate Connection

Cocoa bean shell is an attractive, fine quality mulch used frequently in formal gardens, especially rose and herb gardens. While this mulch may look and even smell attractive as a mulch product, when ingested by dogs with indiscriminant eating habits, it can cause gastrointestinal upset (vomiting), rapid heart rate, seizures, muscle tremors and in **very rare instances** death. Found in most home centers, cocoa bean shell mulch, a by-product of chocolate production, contains two key ingredients, theobromine and caffeine (collectively referred to as methylxanthines). These ingredients, which are also in chocolate, can cause methoxyxanthine toxicosis when ingested. A story circulating on the internet claimed a dog named Calypso died after ingesting the product, however, according to Dr. Steve Hansen, director of the American Society for the Prevention of Cruelty to Animals' Animal Poison Control Center, "A necropsy would have likely shown that Calypso had an underlying condition that caused her death." Best advice? If you want to avoid a problem, don't use cocoa bean shell mulch in areas where unsupervised dogs may have access. ■



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