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**Abstract.** Trees growing beneath electrical power lines are often subjected to heading cuts made during roundover trimming. Heading cuts create wounds that allow decay to enter the branch, and a decay column will form if the tree does not contain it with compartmental reaction zones. The presence of a sizable decay column may predispose the leader to failure, especially when the tree has been converted from a roundover to a V-trim. The objectives of this study were to quantify the amount of decay in silver maples (*Acer saccharinum* L.) converted from roundover to V-trims and to develop models to allow utility arborists to estimate the extent of internal decay columns. Parent stems (leaders) were removed from converted trees, cut into 50 cm (20 in) sections, and measured for internal and external decay. Eighty percent of the leaders had internal decay columns beginning within 50 cm (20 in) of the heading cut and internal decay columns were found to be over 2 1/2 times longer than the length of external decay. Models are presented to predict the length and volume of internal decay from external measurements on the leader, including length of external decay.

**Key Words.** *Acer saccharinum*; Heading Cuts; Line Clearance; Roundover; Utility Arboriculture; V-trimming; Wood Decay.

W. Todd Watson and Tomas Martinez-Trinidad  
**Strategies and Treatments for Leafy Mistletoe (*Phoradendron tomentosum* [DC.]  
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**Abstract.** Leafy mistletoe, *Phoradendron tomentosum* (DC.) Engelm ex. Gray, can adversely affect trees growing in urban environments. The efficacy of several methods for controlling *P. tomentosum* in *Ulmus crassifolia* was evaluated in two separate trials. In the first experiment, eight treatments with five replicate trees, 20.3 to 30.5 cm (8.1 to 12.2 in) dbh, were evaluated. Removal of the branch 30.5 cm (12.2 in) below the mistletoe, removal of mistletoe, and treating the branch bark with naphthaleneacetic acid (NAA) or a caulking compound in which mistletoe was removed resulted in reduced regrowth of the ectophyte (>90%) after 5 months. The use of growth regulator and herbicides (ethephon, 2,4-D, and glyphosate) on intact mistletoe plants in experiment 1 did not provide acceptable control of mistletoe. After 29 months, only removal of the branch and caulking over the bark after mistletoe removal demonstrated a significant long-term effect on mistletoe mortality (40% and 57%, respectively). In the second experiment, a new treatment was evaluated based on the results from the first experiment. The use of NAA and light exclusion (black latex paint) reduced the resprouting of mistletoe by 50% after 8 months, but this effect diminished over time. However, 16 months after application, NAA and paint significantly reduced regrowth compared with removing mistletoe alone. This study provides strategies to achieve acceptable short-term control and long-term management of leafy mistletoe in urban trees.

**Key Words.** Auxin; Christmas Mistletoe; Herbicide; Parasitic Plant; Pest.

Michael F. Galvin  
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**Abstract.** In 2005, Maryland's tree expert licensing law, initially enacted in 1945, was amended to include tree removal as an activity requiring a tree expert license. The Maryland Department of Natural Resources (MD DNR) sought to identify and communicate with the potentially affected community regarding the pending changes in the law by a number of means, including a search of companies advertising tree services in Maryland by online phone listings. The majority of firms (69.91%) found to be advertising tree services online were unlicensed tree experts (UnLTEs). A significant number of those UnLTEs (40%) did not provide full contact information, including a street address, and no current address was available for over 25% of them. Only 21 of the UnLTEs studied had ever been the subject of a complaint to MD DNR and those firms accounted for only 18.2% of complaints MD DNR received regarding UnLTEs during a 10 year period. UnLTEs were found in approximately equal measure in one of three business types: incorporated, unincorporated, or unknown (sole proprietorships, general partnerships, or noncompliant). UnLTEs are fairly ubiquitous in small numbers across Maryland with the largest concentrations found close to the borders of adjacent states, in the northeast metropolitan area of Maryland's largest city (Baltimore), and around the state capital (Annapolis).

**Key Words.** Arborists' Licensing; Commercial Arborists; Tree Experts.

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**Key Words.** Carbohydrates; Carbon Compensation; Carotenoids; Chlorophyll Fluorescence; Holly; Oak; Photosynthetic Chlorophylls; Photosystem II; Urban Trees.

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**Key Words.** Aesthetic Injury Level; *Anisota senatoria*; Integrated Pest Management.

Bruce R. Roberts

**Compost-Containing Substrates and Their Effect on  
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**Abstract.** Greenhouse studies were undertaken to determine the influence of composted media on the posttransplant growth of containerized red maple, sugar maple, and green ash seedlings. Before planting, the chemical and physical properties of each substrate were measured. For media containing composted biosolids, pH was significantly higher, whereas electrical conductivity, air-filled porosity, and total pore space were significantly lower than in a composted medium without biosolids. For composted substrates containing at least some soil, bulk density, particle density, and container capacity were all significantly greater than for composts without any soil. Growth of red maple was about the same in a noncomposted soilless medium (Metro-mix 360) as it was in substrates containing biosolid compost. Height growth, total biomass, and root biomass of green ash were all significantly greater for seedlings grown in Metro-mix 360 only, and the growth of sugar maple seedlings was about the same in Metro-mix 360 or in a composted substrate without biosolids (Metro-mix 560). The results of this study suggest no particular short-term growth advantage of using composted media as backfill amendments when transplanting; however, the addition of composts could be beneficial in improving the chemical and physical properties of native soils, particularly urban soils containing very low levels of organic matter.

**Key Words.** *Acer rubrum* L.; *Acer saccharum* Marsh.; Biosolids; *Fraxinus pennsylvanica* Marsh; Soil Amendments; Soil Properties; Tree Establishment.

Michael J. Raupp, Anne Buckelew Cumming, and Erin C. Raupp

**Street Tree Diversity in Eastern North America and Its Potential for Tree Loss to Exotic Borers** .....

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**Abstract.** In light of catastrophic tree losses caused by Dutch elm disease, foresters recommended that the urban forest be diversified. The intent was to create a more sustainable urban forest that would not be decimated by a single pathogen or insect pest. However, recent introductions of deadly borers such as Asian longhorned beetle and emerald ash borer reveal that new introductions can have disastrous consequences for urban forests. An analysis of tree inventories from 12 cities in eastern North America reveals an overabundance of certain genera of trees such as *Acer* and *Fraxinus*. Introduced pests with broad host ranges such as the Asian longhorned beetle may be capable of killing or forcing intervention on large numbers of trees. Even cities that have diversified at a low taxonomic level (cultivar or species) may suffer greatly from the depredations of insect pests such as the emerald ash borer that specialize on plants at the generic level. Generalists capable of feeding on plants in several families will create problems for urban forests even when attempts have been made to diversify at higher taxonomic levels. Urban foresters should avoid planting susceptible taxa of trees, especially in cities that are overstocked in these taxa, and consider diversifying greatly the types of trees in cities.

**Key Words.** Asian Longhorned Beetle; Diversity; Emerald Ash Borer; Risk; Street Trees; Sustainability; Urban Forestry.

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Christina Wells, Karen Townsend, Judy Caldwell, Donald Ham, E. Thomas Smiley, and Michael Sherwood

**Effects of Planting Depth on Landscape Tree Survival and Girdling Root Formation**.....

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**Abstract.** Landscape trees are frequently planted with their root collars below grade, a practice that may predispose them to transplant failure and girdling root formation. The objective of the present research was to examine the effect of planting depth on the health, survival, and root development of two popular landscape trees, red maple (*Acer rubrum*) and Yoshino cherry (*Prunus × yedoensis*). Trees were transplanted with their root flares at grade, 15 cm (6 in) below grade, or 31 cm (12 in) below grade. Deep planting reduced the survival of Yoshino cherries: 2 years after transplant, 50% of the 15 cm (6 in) and 31 cm (12 in) deep-planted cherries had died, whereas all the cherries planted at grade had survived. Survival of maples was not affected by planting depth. Deep planting also influenced the development of girdling roots. Three years after transplant, maples planted at grade had 14% of their trunk circumference encircled by girdling or potentially girdling roots; this number rose to 48% and 71% for 15 cm (6 in) and 31 cm (12 in) deep-planted maples, respectively. There were no treatment-related differences in girdling root development in the cherries. These results are consistent with arborists' observations that deep planting is a significant source of stress in landscape trees.

**Key Words.** *Acer rubrum*; Girdling Root; Planting Depth; *Prunus × yedoensis*.

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