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Abstract. Building new homes on wooded lots is common in the upper Midwest, United States. Existing trees are often left behind during construction to become part of the future landscape. A study conducted in 1980 found that homebuilders in Portage County, Wisconsin, U.S. generally had a poor understanding of how construction activities could impact the health of trees intended to be preserved. Researchers replicated that study 27 years later by surveying homebuilders in the same region to see how their tree preservation knowledge and use of construction activities have changed during that time. The results indicate few construction activities changed significantly, showing that little has changed overall to improve tree preservation. Even though builders significantly improved their knowledge of the negative effects that storage of fill soil on roots poses to tree preservation, they also significantly increased usage of that very same activity. Builders almost never consulted a tree preservation expert and thought doing so was the least important activity when making tree preservation decisions. Interest in a tree preservation training workshop was limited. Unless pressured by consumer demand or regulation, builders will probably not improve their tree preservation knowledge, change their construction activities, or include tree experts anywhere in the process.

Key Words. Construction; Damage; Followup; Home Builders; Landscape; Perceptions; Public; Tree Experts.

Abstract. Street trees provide numerous environmental, community, and health benefits, but municipal urban forestry programs often lack the public resources to adequately maintain trees, particularly in the time immediately following planting. Watering trees in the first three years after planting is critical for tree survival. A quasi-experimental design was used to test whether an outreach intervention impacted residents' street tree watering behavior, and whether their watering behavior enhanced soil moisture, an important outcome for tree growth. Residents at mailing addresses for trees in the treatment group received educational materials about watering, while the control group received no educational materials. Soil moisture data was collected weekly at every tree throughout the growing season (May–September 2012) and used as a proxy for residents' watering behavior. Results indicate that the postcards had a positive impact on residents' watering behavior, but that the impact diminished over time. While the impact of the postcards on soil moisture was not statistically significant, the evaluation of the outreach intervention has practical significance for future educational efforts to engage residents in street tree watering.

Key Words. Community Engagement; Soil Moisture; Stewardship; Urban Trees.

Abstract. Past research has examined the effect of urban trees, and other vegetation, on stormwater runoff using hydrological models or small-scale experiments. However, there has been no statistical analysis of the influence of vegetation on runoff in an intact urban watershed, and it is not clear how results from small-scale studies scale up to the city level. Researchers address this gap in the literature by estimating random-effects regression models of the effect of trees and other vegetation on total runoff and peak runoff for a summer (15–16 June 2010) and a winter (18–19 December 2010) storm in Portland, Oregon, U.S. Researchers found that additional tree canopy cover was associated with lower runoff in the summer storm, but the significance of the tree coefficient was sensitive to model structure. Researchers found that additional groundcover (grass and shrubs) associated with lower peak flow in the summer, and this result was robust to model structure. Neither trees nor groundcover were significantly associated with winter stormwater runoff. Results suggest that trees and other vegetation can be effective at moderating stormwater runoff. However, vegetation is not as effective in the winter, which is consistent with past modeling and experimental studies.

Key Words. Economics; Hydrology; Oregon; Portland; Runoff; Stormwater; Trees; Urban Forestry Vegetation.

Abstract. Three independent experiments assessed CO_2 assimilation and metals leaf deposition of seven evergreen shrub species (*Arbutus unedo* L., *Elaeagnus* × *ebbingei* L., *Laurus nobilis* L., *Ligustrum japonicum* Thunb., *Photinia* × *fraseri* Dress., *Viburnum tinus* subsp. *lucidum* L., and *Viburnum tinus* subsp. *tinus* L.). CO_2 assimilation and carbon allocation were determined in 2011 (Exp. 1) under optimal water availability and in 2012 (Exp. 2) under drought on potted plants. A third experiment (Exp. 3) measured seasonal leaf depositions of Cd, Cu, Ni, Pb, and Zn in 2011 on plants transplanted in proximity of a four-lane road.

E. × *ebbingei* showed the highest CO_2 assimilation under optimal water availability but one of the lowest under drought (Exp. 1, 2). Conversely, *P.* × *fraseri* had intermediate CO_2 assimilation but it declined less during drought compared to the other species. In Experiment 3, *E.* × *ebbingei* showed the highest metal deposition, mainly due to its greater leaf area. Greater rainfall and RH% decreased metal depositions, whilst greater wind velocity and air temperature increased leaf depositions. Species which drastically reduce CO_2 assimilation under drought (*V. tinus* subsp. *lucidum*, L. *japonicum*, *E.* × *ebbingei*) are not recommended in drought-prone environments, where drought-tolerant "mesic" species (*P.* × *fraseri*), should be preferred. *E.* × *ebbingei* could be used to optimize deposition of metals. The three experiments provide useful insights especially about CO_2 assimilation (Exp. 1, 2) and air pollution mitigation (Exp. 3) of widely used shrubs for application in urban areas and planning of roadside greening in southern Europe.

Key Words. *Arbutus unedo* L.; CO_2 Assimilation; Drought; *Elaeagnus* × *ebbingei* L.; Italy; *Laurus nobilis* L.; Leaf Deposition; *Ligustrum japonicum* Thunb.; Meteorological Parameters; *Photinia* × *fraseri* Dress.; Relative Growth Rate; Seasonal Trend; Shrub; Trace Metals; Traffic Pollution; *Viburnum tinus* subsp. *lucidum* L.; *Viburnum tinus* subsp. *tinus* L.

Abstract. Seven species of hemlock (*Tsuga* spp.)—four from North America and three from Asia—were evaluated in replicated plots in Katonah, New York, United States (USDA Plant Hardiness Zone 6b) as potential replacements for eastern hemlock (*Tsuga canadensis*), which is gradually being extirpated from landscapes in the eastern United States. by the invasive hemlock woolly adelgid (*Adelges tsugae*). Trends reported in an earlier study (Weston and Harper 2009) continued but were exaggerated after an additional three years of observation. For example, Chinese hemlock (*T. chinensis*) continued to show the greatest potential as a replacement for *T. canadensis* as mortality was very low, overall plant health was exceptional, and tolerance to *A. tsugae* was robust. Early indicators suggest that *T. chinensis* may also be readily propagated from hardwood cuttings under appropriate greenhouse conditions. These characteristics suggest that *T. chinensis* may indeed become a viable replacement for *T. canadensis,* and a valuable addition to landscapes in the eastern U.S.

Key Words. Elongate Hemlock Scale; Hemlock; Hemlock Woolly Adelgid; Host Resistance; *Tsuga canadensis*; *Tsuga caroliniana*; *Tsuga chinensis*; *Tsuga diversifolia*; *Tsuga heterophylla*; *Tsuga mertensiana*; *Tsuga sieboldii*.

Abstract. The ability of trees to remodel their woody structure after injury or strain to outer tissues greatly assists in their survival; however, this remodeling process is complex because it is influenced by many factors. The speed and extent of remodeling of branch junctions in trees around a mechanical flaw, such as included bark, will dictate to what extent and for how long the junction is mechanically weakened.

In this study, 100 normally formed bifurcations in semi-mature hazel (*Corylus avellana* L.) were artificially modified by being rod-braced, drilled through the apex or split, and then left to grow *in situ*. Two further groups were identified as controls: 120 normally formed bifurcations and 70 bark-included bifurcations. After two to four years, these bifurcations were harvested and underwent tests of their bending strength. The bifurcations rigidly braced over three growing seasons developed adverse taper in their branches and had only 70.5% of the bending strength of the normally formed bifurcations. Bifurcations with the central 20% of the xylem drilled out of them were capable of recovering fully from this defect; in contrast, split bifurcations were found to be highly vulnerable to failure during wind-loading events.

This study concludes that a bifurcation may be considered compromised in its bending strength if its apex is compromised, but that semi-mature bifurcations in hazel do exhibit a good ability to remodel after injury. The role of thigmomorphogenesis in this remodeling process is assessed with reference to the rod-braced specimens that suffered no significant mechanical perturbation at their apices.

Key Words. Bark Inclusion; Bifurcation; Biomechanics; Bracing; *Corylus avellana* L.; England; Hazel; Lancashire; Remodeling; Thigmomorphogenesis; Tree Crotch; Tree Fork.