



CONTENTS

Journal Announcement 1

After seven years of service as Editor in Chief (EIC) of *Arboriculture & Urban Forestry* and chair of the journal's editorial board, Dr. Gary Watson bids farewell to pursue other challenges and opportunities in his role as Director of Research at The Morton Arboretum (Lisle, Illinois, U.S.). The journal editorial board, ISA staff, and ISA membership thank Dr. Watson for his tireless efforts in developing and refining the manuscript submission and review process. In addition, under his leadership, the editorial board transitioned into a larger, more international group of experts and developed a greater focus resulting in the stronger journal that we enjoy today.

We all hope to continue this stewardship by developing further strategies for increasing citation rates and thus the prominence of the journal for the research community. This is a goal we will need to reach while also meeting the needs of the practicing tree care professional. The journal will continue in its mission to foster a greater appreciation for trees and to promote the research, technology, and practice of professional arboriculture and urban forestry.

As of this issue of *Arboriculture & Urban Forestry* the transition to a new Editor in Chief is well underway. Dr. Jason Grabosky, a professor at Rutgers University's School of Environmental and Biological Sciences (New Brunswick, New Jersey, U.S.) has agreed to serve in the role of EIC. The editorial transition began in November 2014, and Grabosky will be formally appointed in January 2015. The editorial transition was developed by journal staff, whom in working with the Arboricultural Research & Education Academy and the Research Committee, produced a slate of appropriate candidates.

We appreciate the patience of those who are affiliated with the journal as well as with those of whom are submitting manuscripts in this time of transition. Dr. Watson's knowledge and hard work has positioned the journal very favorably, and it is with this stability that we look forward to a seamless transfer of responsibilities.

Edward F. Gilman, Jason W. Miesbauer, and F.J. Masters

Structural Pruning Effects on Stem and Trunk Strain in Wind 3

Abstract. Pruning removes mass and reduces bending in the wind on the pruned stem. However, little is known about the impacts of structural pruning, which leaves some parts of the tree not pruned. This study was designed to measure change in stem and trunk strain (ϵ) in turbulent wind from reducing the length of one side of a codominant stem pair. Trees were placed in front of a storm simulator with airfoils directing 22 m/s wind at four frequencies $f(a) = 0.3, 0.5, 0.7,$ and 0.9 Hz. Trees were subjected to 30 cycles at each $f(a)$ at each of four pruning doses—0%, 33%, 66%, and 100% foliage (and associated branch mass) removed from the smaller codominant stem. This resulted in 16 trials on each of five trees. The non-pruned stem of a codominant pair experienced no ϵ change in wind following reduction or removal of the competing codominant stem. Strain (ϵ) on the pruned codominant stem and on the trunk below the union where stems join decreased linearly with pruning dose and increased with $f(a)$.

Key Words. Aspect Ratio; Biomechanics; Codominant Stems; Pruning; Reduction Cut; Removal Cut; Subordinate.

Edward F. Gilman

Pruning *Acer rubrum* at Planting Impacts Structure and Growth After Three Growing Seasons 11

Abstract. Branches present in the tree crown at planting can become obstructions in urban landscapes, requiring large pruning cuts later and possibly creating weak structure by growing upright to comprise a large section of the crown. Pruning at planting, currently a discouraged practice, could shorten or remove selected branches and thus improve the structure of a newly planted tree. *Acer rubrum* L. trees planted into soil from 170 L containers were pruned at planting to subordinate the largest primary branches, or not. Pruning induced a 26% reduction in total cross-sectional area in the five largest primary branches. This sizable reduction in growth on pruned branches resulted in a significant reduction in aspect ratio of the largest (11%) and three largest (10%) branches. The negligible pruning wound from raising the crown on pruned trees would result in little trunk dysfunction when branches are later removed for clearance, and the debris would be minimal. Tree height growth after three growing seasons was unaffected by pruning; the 8% slower trunk diameter growth might be difficult to recognize in a landscape. Bending stress required to tilt trunks three growing seasons after planting was equivalent with or without pruning.

Key Words. *Acer rubrum*; Aspect Ratio; Formative Pruning; Inclusions; Structural Pruning; Subordination; Union Strength.

Andrew Koeser, Richard Hauer, Jeff Edgar, and David Kleinhuizen

Impacts of Wire Basket Retention and Removal on Planting Time, Root-Ball Condition, and Early Growth of *Acer platanoides* and *Gleditsia triacanthos* var. *inermis*..... 18

Abstract. The use of wire baskets to maintain root-ball integrity has greatly increased the efficiency of balled-and-burlapped harvesting practices. Despite the advantages offered by these products, there is notable disagreement among green industry groups and practitioners regarding the effects of wire basket retention or removal at the time of planting. For this experiment, 30 Norway maple (*Acer platanoides*) and 30 honeylocust (*Gleditsia triacanthos* var. *inermis* 'Skycole') shade trees were evenly planted at two sites in the midwestern U.S. after random assignment of a wire-basket removal treatment (i.e., no removal/intact, partial removal, and full removal). Planting time and initial root-ball condition were assessed at the time of installation. Short-term growth and plant stress were assessed each season as trees became established in the research plots. Results indicate that treatment impacted both planting time ($P < 0.0001$; both sites) and root-ball condition ($P = 0.0360$ or $P = 0.0049$; depending on site). In contrast, treatment had limited impact on tree caliper, twig elongation, or chlorophyll fluorescence in the first two to three years after planting.

Key Words. *Acer platanoides*; Burlap; *Gleditsia triacanthos*; honeylocust; Midwest; Minnesota; Norway maple; Planting Survival; Transplanting; Tree Stability; Wire Basket; Wisconsin.

Jennifer Vander Vecht and Tenley M. Conway

Comparing Species Composition and Planting Trends: Exploring Pest Vulnerability in Toronto's Urban Forest..... 26

Abstract. Urban forests represent a valuable resource for cities but are not without costs. These costs can include time, money, and the loss of beneficial services as results of pest infestations. Knowledge of an urban forest's tree species composition and vulnerability to pests is needed to help managers enhance services delivered, while minimizing expenses over the long-term. Recent research has explored the impacts of individual pests on urban forests, but less attention has been given to the overall pest vulnerability. In this research, tree genera currently prevalent and commonly planted in Toronto, Ontario, Canada, were analyzed using a pest vulnerability matrix to explore how the city's urban forest species composition and pest vulnerability may be changing. Current tree species composition was derived from existing inventory data, while the planting trends of a variety of local actors were determined through surveys and interviews. Results indicate there is somewhat limited diversity in current street and non-street tree populations, as well as a number of common tree species that have severe pest vulnerabilities. While new plantings replicate some current composition and pest vulnerability issues, several less common species are also being planted. As a result, overall pest vulnerability should decrease in the future, while some ongoing management concerns remain.

Key Words. Canada; Ontario; Pest Vulnerability; Pest Vulnerability Matrix; Planting Trends; Species Diversity; Survey; Toronto; Tree Pests; Urban Forests.

Jason E.E. Dampier, Richard W. Harper, Lora Schwartzberg, and R. Harvey Lemelin

A Comparison of Arborists' and Horticulturists' Preferences of *Tsuga chinensis* to *T. canadensis* in the Urban Landscape. 41

Abstract. Recent research describing host resistance of hemlocks to the lethal, invasive insect hemlock woolly adelgid has suggested that Chinese hemlock (*Tsuga chinensis*) may be a suitable pest-resistant urban landscape replacement for eastern hemlock (*T. canadensis*). Presented here are the research findings of an *in situ* field questionnaire survey and participant observations. The study's objective was to collect and evaluate arborists' and other horticulturists' perceptions and purchase preferences between eastern and Chinese hemlock to assess whether Chinese hemlock has potential to be accepted as an alternative landscape replacement for eastern hemlock. Fifty-five participants visually inspected both hemlock specimens and responded to questions about which one they would prefer to purchase, what their preferences would be in light of potential insect resistance, and the likelihood of fewer insecticide applications being required. Multiple cross-tabulations indicated that there was no statistical association (Fisher's Exact Test, $P > 0.05$) between participant background (i.e., arborists versus others) and questions related to general purchase preference, and purchase preference if a specimen exhibited natural pest resistance or required less pesticides. Over three-quarters of participants were more inclined to purchase the specimen that possessed resistance to a serious pest. These findings suggest that Chinese hemlock may potentially serve as a hemlock woolly adelgid-resistant alternative to eastern hemlock in the landscape.

Key Words. *Adelges tsugae*; Arborist; Chinese Hemlock; Eastern Hemlock; Hemlock Woolly Adelgid; Horticulturist; Invasive Species; Participant Perceptions; Survey; *Tsuga canadensis*; *Tsuga chinensis*.