Restoration in the Aftermath of Emerald Ash Borer: How Well Are We Doing?

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### Terex Environmental Equipment Specifications

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Operating Weight</th>
<th>Width</th>
<th>Height</th>
<th>Transport Length</th>
<th>Gross Engine Power</th>
<th>Chipping Capacity</th>
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<tbody>
<tr>
<td>700</td>
<td>1,925 lbs</td>
<td>53.5&quot;</td>
<td>94&quot;</td>
<td>83&quot;</td>
<td>27-35 hp</td>
<td>6&quot;</td>
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<tr>
<td>705</td>
<td>2,050 lbs</td>
<td>63&quot;</td>
<td>96&quot;</td>
<td>102&quot;</td>
<td>27-35 hp</td>
<td>6&quot;</td>
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<tr>
<td>710</td>
<td>2,750 lbs</td>
<td>63&quot;</td>
<td>92&quot;</td>
<td>117&quot;</td>
<td>35-47 hp</td>
<td>9&quot;</td>
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<tr>
<td>715</td>
<td>4,400 lbs</td>
<td>90&quot;</td>
<td>96&quot;</td>
<td>151&quot;</td>
<td>80-90 hp</td>
<td>10&quot;</td>
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<tr>
<td>720</td>
<td>5,100 lbs</td>
<td>72&quot;</td>
<td>96&quot;</td>
<td>156&quot;</td>
<td>84-99 hp</td>
<td>13&quot;</td>
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<tr>
<td>730</td>
<td>5,200 lbs</td>
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<td>96&quot;</td>
<td>156&quot;</td>
<td>84-99 hp</td>
<td>13&quot;</td>
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<tr>
<td>750</td>
<td>7,200 lbs</td>
<td>72&quot;</td>
<td>102&quot;</td>
<td>176&quot;</td>
<td>99-140 hp</td>
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<tr>
<td>770</td>
<td>9,000 lbs</td>
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<td>104&quot;</td>
<td>196&quot;</td>
<td>142-250 hp</td>
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<tr>
<td>790</td>
<td>12,000 lbs</td>
<td>102&quot;</td>
<td>110&quot;</td>
<td>220&quot;</td>
<td>173-375 hp</td>
<td>19&quot;</td>
</tr>
</tbody>
</table>

Product specifications are subject to change without notice or obligation.

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You might have heard or read somewhere that TCIA is celebrating its 75th anniversary this year. We certainly hope you have enjoyed the series of articles in the magazine, as well as the photo and video archives on the Web. We know we’ve had fun researching our past and, most enjoyably, reaching out to those who’ve helped shape this industry and association over the years. In retirement, many still treasure their involvement with the profession and the association. They have great stories … some of which we’ve even been able to publish.

Outside the office, when we meet up with past members and friends, it comes as something of a shock to realize that it’s been 15 years since that energetic volunteer left the Board of Directors. I’m sure many have had similar revelations. The person you hired to drag brush years ago is now a crew leader or operations manager. The person you weren’t sure could cut it dragging hoses now runs your entire PHC operation.

Looking back, while interesting, should also help inform us about moving forward. Who in your current operation should be marked for advancement? What did you do right to keep those good employees for all these years? Are you doing enough to keep your very best employees encouraged and engaged for the next decade? When you look back 10 or 20 years from now, who will still be with you? What will your company have become over those years? Do you have a vision of how you’re planning to get there?

Internally, TCIA’s fiscal year ended August 31, and that meant much of September was filled with annual reports, performance evaluations, and analyzing numbers or trends. During our look back at the year that passed – in addition to celebrating a very good year – we were able to appreciate that the young fellow who started here as the staff arborist in 1985 has been advancing safety with the association for almost 30 years now. We paused to acknowledge that receptionists and shipping clerks at TCIA, after training and college courses, became office managers, accounting assistants and database administrators with tenures passing a decade. Another staff arborist hired in the 1990s has been helping to write standards for the industry for almost 20 years.

An old friend wiser than I once insisted to me that “Life was the accumulation of good stories. We should take pleasure in living them and then retelling them often.”

I agree with him – though my kids would disagree with the value of hearing my stories over and over.

I invite you to come to Charlotte for TCI EXPO 2013, where you can view our 75th anniversary museum, accumulate some new stories, and perhaps retell a few old stories to an eager audience than hasn’t heard them more than a few times already.

Mark Garvin
Publisher
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We may be heading in the right direction in our plant selection and restoration attempts in the aftermath of emerald ash borer. Results of a recent study indicate that as early as a decade after restoration, tree benefits of small-sized replants can meet and in some cases surpass an existing, larger-stemmed ash canopy.

Introduction

A regional survey was conducted in 2008 in northwest Ohio to examine the management of ash trees in areas that were infested with the emerald ash borer, Agrilus planipennis (EAB). Management of EAB in Ohio involved a three-pronged approach in which some trees were removed and the areas were either fully or partially replanted (restored), some trees that were candidates for preservation were treated using suitable products, and some trees that were not in the immediate urban centers were left without any action taken. The survey grew in scope with the spread of EAB until 2012-13. Forty study sites spread throughout the EAB distributional range in North America were established (Figure 1).

This article presents data obtained from the study and involves input from personnel involved in managing the urban forestry of researched sites. At sample sites, ash preservation and removal and replanting efforts had occurred or were ongoing.

Removals: The tale of the tape

At study sites, ash tree removals were either carried out preemptively before the onset of EAB or post-infestation, typically within one to three years of becoming infested. Removal of ash trees, which in some cases accounted for 80 percent of the urban forest, may result in significant mortality gaps in community green spaces. Average ash tree constituent of the urban canopy was 15 percent overall at study sites throughout North America. Trees in the study were grouped in five classes based on the diameter at breast height (DBH/inches) measurements (Figure 2).

An overall evaluation of ash stems that were removed at study sites revealed that significantly more trees in the <5 inch, 6-10 inch and the >40 inch DBH categories were preemptively removed as opposed to the 11- to 25-inch DBH class, which had more trees removed after infestation by EAB. This observation aligns well with the economics of removing smaller trees that may cost less to dismantle. Removing large trees (>40 inches DBH) preemptively may be more economically feasible and safer compared to the higher costs associated with infested or dead trees that pose additional risk.
Restoration: Criteria for choosing replants

Restoration of ash mortality gaps occurred in some cases proactively (Figure 3) and replants were installed adjacent to an ash tree that was deemed a candidate for future removal.

Aesthetics and appearance in the urban space, plant suitability for the urban site, commercial availability of trees, trees to enhance species diversity, trees that would deliver most compensatory benefits and “any tree but ash” were all major plant selection criteria that were put forward.

Restoration:
Compensatory values of replants

I-Tree Design (i-tree.org) was used to determine compensatory values (combined reduced storm water runoff, enhanced air quality and CO₂ sequestration values in USD) for 19 tree species in restored areas. Five-, 10- and 30-year projection of benefits of a 5-inch caliper stem were calculated for 40 replicates of each of the 19 tree species in the sample areas spread throughout the EAB distributional range. This analysis revealed that when compared to an existing 15-inch DBH ash stem in similar geographic locations as early as five years after replanting, two of the 19 species (mulberry and horse chestnut, Figure 4) had statistically similar accumulative compensatory values to the ash (which also would have increased incrementally). After a decade, the accumulative compensatory values of five tree species were now homogenous with those of the 15-inch DBH ash. Two species of trees, sweetgum and mulberry, surpassed the total accumulated benefits of the comparable 15 inch ash. After three decades of these replants in the ground, total accumulative compensatory values of the 15-inch ash would be significantly surpassed by the 5-inch sweetgum and statistically homogenous with 10 species of the replants.

These data thus indicate that as early as a decade after restoration tree benefits of small-sized replants can meet and in some cases surpass an existing, larger-stemmed ash canopy. We may thus be heading in the right direction in our plant selection and restoration attempts in the aftermath of EAB. Bearing in mind the often harsh conditions of our urban spaces, we assume that the trees take hold and become successfully established with good canopy structure. Restoration efforts allow for urban canopy improvement; how well we take advantage of the opportunity to do it right this time around will ultimately describe our success.

Restoration and biomechanics

Another major challenge at replanting in urban areas is the close proximity of urban trees to structures and high traffic usage areas, which make tolerance to wind, snow...
and ice loading of branches and stems more critical. How well are we doing at selecting trees that are biomechanically suitable for being urban trees?

Ash is neither a very strong tree nor is it considered a weak tree by virtue of its ability to adapt to a range of conditions and being a survivor of natural events in the urban environment. Many of the replants in this study match or exceed the associated structural integrity of ash in the urban environment. In fact, it seems that we are planting more biomechanically suitable species for the urban environment in our restoration programs (Figure 5). Having a more biomechanically stable urban tree canopy will pay dividends as trees mature in our urban greenspaces and risks associated with branch and stem failure after natural events are somewhat reduced.

Ash tree preservation and restoration

Ash trees that are candidates for preservation may remain part of the urban forest once product application continues as needed. Whether treatment was done proactively before the presence of EAB at study sites or after infestation (curatively) was examined in this study. At all sites examined for each of the five diameter classes, no significant variation was observed between trees that were proactively treated and trees that were curatively (post infestation). This may indicate that managing EAB by tree preservation depends on presence in the immediate area. Communities may have to work harder at proactive planning and implementation; a hard budgetary sell if the threat is not visible enough.

Restoration and urban environmental pressures

Major issues in the urban environment include and range from “wrong plant in the wrong place,” insect and disease, and deicing salt damage to the effects of pollution on tree canopies. How well are we doing at restoration and selecting for plant suitability in the urban greenspace? Of the 19 species that were examined in this study, canopy health ratings (in some cases after seven years of restoration) give us some insight into our successes during the establishment (Figure 6).

While many of the replant species are good to ideal candidates for selection in
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replanting urban greenspaces, canopy health reflects the successes of our installation and maintenance practices.

Most of the species in this study received scores above the 50 percent health and aesthetic value of 30 (trees were given a 0-60 rating based on canopy fill and twig elongation) used to characterize plant health. Estimating the long-term successes of selected species is complex and relies on suitable aftercare, structural pruning, provision of irrigation, fertilization, etc. The urban environment presents challenges for replants, however we now have the ability to replant using insect- and disease-resistant plant material. Additionally we can implement right-tree-in-the-right-place along with proper planting techniques and post planting care.

Future challenges and stories learned

Challenges with restoration no doubt lie ahead as we continue to plan and mitigate our responses while keeping in mind our finite budgets. Resources that are infused into our restoration programs when EAB is discovered in a community emanate from a successful confluence of the political, educational, marketing, economic, regulatory and people elements. Lessons learned with the EAB experience should provide a template upon which we continue to carve our experiences with this and other invasive species in our urban greenspaces.

EAB has effectively brought community responsiveness into the limelight, along with a spirit of togetherness and cooperation and, in some cases, a rekindling of sorts when it comes to the value of urban trees.

We have begun to move from monoculture urban plantings to incorporating diversity and selecting planting material suitable for urban environments. EAB has effectively brought community responsiveness into the limelight, along with a spirit of togetherness and cooperation and, in some cases, a rekindling of sorts when it comes to the value of urban trees. EAB impact also presents a frontier for conservation of urban ecosystems and a forum opportunity for the community to direct its political, social and economic forces to the restoration of our green spaces.

As many communities deal with or are beginning to experience the impact of EAB, they can be inspired by stories of strategic and effective restoration and the promise of a re-energized urban forest. Maybe, in the end, we win.

Anand B. Persad, Ph.D., is a Board Certified Entomologist with the Davey Institute in Kent, Ohio.
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Access to legal seasonal workers is vital to many tree care and landscape businesses. Currently there is immigration reform legislation before both the U.S. House and Senate that preserves the H-2B seasonal worker program, includes a fair and reasonable approach to setting H-2B wages, and does not impose new program costs and complexities.

TCIA strongly encourages business owners to ask the Department of Homeland Security (DHS) and Department of Labor (DOL) to rescind a burdensome new H-2B wage regulation that is extremely detrimental to business by contacting their senator or congressperson.

Part of the business owner’s challenge in trying to maintain a legal workforce is that not enough American workers actually apply for seasonal tree care/landscape jobs because of the temporary nature and physical demands of the work.

The existing H-2B program provides companies with a reliable, if somewhat limited, source of documented, seasonal, visa-holding workers. This program, however, is very complicated, costly, and time consuming.

A new Department of Labor (DOL) and Department of Homeland Security (DHS) regulation threatens the viability of the H-2B program. On March 21, 2013, a Pennsylvania Federal District Court judge invalidated a provision of the 2008 H-2B regulations that outlines how prevailing wages are to be set using Bureau of Labor Statistics data and gave the DOL 30 days to come into compliance.

In response to the court order and after a temporary suspension of H-2B application processing, on April 24, 2013, the DHS and DOL issued a joint interim final rule that became effective immediately and is subjecting tree care/landscape companies to an approximately 32 percent increase in wages.

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Crane operators beware Chinese polyester slings

A damaged polyester crane sling was discovered during a routine safety audit. The label indicated, “If red core yarns are visible remove the sling from service.”

Upon further inspection, the red core warning yarn was not present. Three similar slings were removed from service. None of these slings contained red core warning yarn as indicated on the labels.

United Rentals, a supplier of these slings, cut six polyester slings. All six slings were missing the red core warning yarn. United Rentals has removed this product from their inventory and will discontinue supplying slings from this particular manufacturer to its vendors.

Corrective Action: TCIA suggests closely inspecting and possibly removing from service any polyester slings manufactured in China from the source depicted in the photos below.

Sender Cutting Edge News items to: editor@tcia.org

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Terex Hi-Ranger SCM Series aerial lifts

Terex Hi-Ranger SCM48, SCM50 and SCM55 overcenter material handling aerial devices feature large, open bed space, low travel height and easy maintenance. The side-by-side lower boom configuration provides overall height under 11 feet on a 40-inch frame for greater mobility. The low-profile allows for low platform stow near centerline of the truck for exceptional clearance of overhead obstructions. The lower boom cylinder design also allows for a large amount of open truck-bed space. The patented Terex Tri-Link Elbow offers a low-maintenance design with easy access to greasable bushings and bearings, needs no lift chains or cables, and does not require a mandatory overhaul during the truck’s lifetime. All models have a GVW rating of 31,000 pounds. They have a 48-, 50- and 55-foot bottom of platform height, respectively. The Terex HyPower Hybrid System, is an available option. (www.terexutilities.com)

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Cutting Edge - Products

Echo CS-620P high-power chain saw

Echo Incorporated’s new CS-620P 59.8cc high-power professional chain saw is based on the company’s proven model CS-600P, but with a modified engine to produce 13 percent more power. The CS-620P is available in 18-, 20-, 24- and 27-inch bar lengths. Features include an aluminum handle with rubber grip, a magnesium sprocket guard, dual bumper spikes, and Echo’s Performance Cutting System. A companion model, the CS-620PW, features a wrap handle to give the user more options when felling a tree. Both use a decompression valve to greatly reduce the starting effort and a digital ignition system, which automatically adjusts engine timing for optimum performance. Other user-friendly features include: tool-less air filter cover, G-Force Engine Air Pre-cleaner, two-piece air filter and see-through fuel tank. CS-620P and CS-620PW are covered by a one-year commercial warranty and five-year consumer warranty. (www.echo-usa.com)

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Silky Tsurugi Curve 330mm large-teeth handsaw

Silky has enhanced the design of its straight Tsurugi into a curved blade. The result is a more aggressive blade that still fits tight crotches without damage to opposing limbs. With its 330mm large teeth, Silky touts this as “the lightest weight, best balanced ‘big saw’ ever produced.” The two-part rubber grip is designed for comfort and held together by an innovative integration with the full-tang blade. Available from SherrillTree, the Tsurugi Curve is available in various blade lengths and two teeth sizes, and comes with an aluminum scabbard. (www.sherrilltree.com)

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Bandit XP-Series Beast Horizontal Grinders

Bandit Industries’ enhanced line of Beast Recyclers offer more than 35 enhancements and add-ons in eight different categories. Model 2680XP, 3680XP and 4680XP now feature angled front infeeds with larger infeed drive chains. Track Beasts feature height-adjustable pans for adjusting feed angle. A new rail system on the return side of the infeed replaces the roller system, reducing load on the tail shaft, and a new “Big Mouth” option increases the height of the opening into the mill. An extra-large 32-inch-diameter feed wheel is optional and includes a brush deflector to better direct material into the machine. In the mill housing, base door openings are larger for easier removal of the cuttermill. Replaceable wear plates are now standard on the left side (radiator side) of the mill base, and optional on both sides. A convenient trap door allows for cleaning in the auger area, while the auger is redesigned and easier to change. Several new teeth styles are available, and are subjected to a new proprietary strengthening process for longer tooth life. New teeth mounts are now compatible with knife cutterbodies, eliminating the need to change cutterbodies when switching between chipping and grinding. There are numerous additional convenience options and enhancements. (www.banditchippers.com)

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Sure, tree guys were cool back then, but 75 years later...
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Events & Seminars

October 2-4, 2013*
Texas Tree Conference
Waco, TX
Contact: www.isatexas.com

October 4-5, 2013
Splicing at Yale Cordage w/New England Chapter ISA
Saco, ME
Contact: www.splicngatyale.eventbrite.com

October 7-9, 2013
Prairie Chapter ISA Annual Meeting
Edmonton, AB, Canada
Contact: www.isaprairie.com

October 9-14, 2013
Citizen Science for Trees symposium
Tree Climbers Rendezvous, Atlanta, GA
Contact: www.treeclimbing.com/rendezvous

October 14-15, 2013*
MidAtlantic Chapter ISA Annual Conference
Fredericksburg, VA
Contact: www.mac-isa.org

October 17-18, 2013
KAA 2013 Annual Conference
Sawyer Hayes Community Center, Louisville, KY
Contact: info@ky-isa.org; (502) 585-2821

October 19, 2013
Kentucky Tree Climbing Championship
Louisville, KY
Contact: info@ky-isa.org; (502) 585-2821

October 21-23, 2013*
Illinois Arborist Association Conference & Trade Show
Tinley Park, IL
Contact: www.illinoisarborist.org

October 24-25, 2013
Trees South Carolina
Folly Beach, SC
Contact: www.treessc.org

November 3-5, 2013
New England Chapter ISA Annual Meeting
Warwick, RI
Contact: www.newenglandisa.org

November 7, 2013
EHAP/Electrical Hazards Awareness Program Workshop
Lussier Heritage Center, Madison, WI
Contact: kritchotte@tcia.org; www.tcia.org

November 13, 2013*
Tree Injection Summit
Bartlett Tree Research Laboratories, Charlotte, NC
Contact: info@tcia.org; www.expo2013.tcia.org

November 14-16, 2013*
2013 TCI EXPO Conference & Trade Show
Pre-conference workshops Nov. 13
Charlotte Convention Center, Charlotte, NC
Contact: 1-800-733-2622; info@tcia.org; www.expo.tci.org

November 15, 2013*
Chipper Operator Specialist workshop
TCI EXPO 2013, Charlotte Conv. Ctr, Charlotte, NC
Contact: info@tcia.org; www.expo2013.tcia.org

November 15, 2013*
Revising the Pruning Standard Open Forum
TCI EXPO 2013, Charlotte Conv. Ctr, Charlotte, NC
Contact: info@tcia.org; www.expo2013.tcia.org

February 2-6, 2014*
Winter Management Conference 2014
Atlantis Paradise Island, Bahamas
Contact: 1-800-733-2622; dmorgan@tcia.org; www.expotci.org

February 5-7, 2014*
New England Grows 2014
Boston Convention & Exhibition Center, Boston, MA

What’s coming in TCI?

Each issue of TCI Magazine contains a variety of articles tailored to the specific needs, concerns and interests arborists. TCI solicits a number of articles from outside writers to keep its editorial content fresh.

Do you have a story for TCI? The editor will be happy to review your idea or manuscript and discuss it with you. Here are some of the upcoming topics for the next two issues:

November
Machinery & Equipment:
Aerial Equipment - Mini-Lifts
Tools & Supplies:
Ropes Cabling and Bracing
Services:
Consulting, Fleet Management
Safety:
Site Set-up
Special:
Southeast Regional Section

December
Machinery & Equipment:
Wood Processing/Biofuel/Mulch
Tools & Supplies:
Snow Removal
Services:
Standards & Compliance
Safety:
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The objective of recent research by scientists at the Morton Arboretum in Lisle, Illinois, was to evaluate the impact of synthetic fertilization, hard-wood mulch, compost, aerated compost tea, and a commercially available biological product on the physical, chemical, and biological properties of soil and tree growth (red maple, *Acer rubrum*, and river birch, *Betula nigra*) on a disturbed urban site over three consecutive years. This article looks at some of the findings.

**Introduction**

Soil quality is degraded and the establishment and growth of urban trees is hindered by urban site disturbances, i.e. construction. Top-soil scraping and sub-soil compaction are often necessary to prepare sites for infrastructure. The removed top-soil is a substantial store of soil organic matter (SOM) and nutrients. Compaction of the sub-soil destroys soil structure, which is important for soil porosity, aeration, drainage, and root growth. Soil degradation is not limited to the site development phase. Urban sites are subjected to continued compaction from foot traffic and heavy machinery and also a number of environmental contaminants (i.e., road salts, heavy metals). Furthermore, nutrient restitution is interrupted when tree growth is hindered and leaves and woody debris are removed from the urban landscapes. For these reasons and many more, the physical, chemical, and biological properties of urban soils are often degraded.

Inorganic fertilizers are commonly applied to supplement nutrient cycling in urban landscapes. The recommended annual rates for landscape tree fertilization are 1-3 kg N/100m²/yr (or 2-6 lbs N/1000 ft²/yr) [which translates to 2 to 6 pounds of nitrogen per 1,000 square feet per year]. A substantial body of literature has demonstrated tree growth improvements with inorganic fertilizers. However, many studies also show negative effects associated with inorganic fertilizers, including: ground and surface water contamination, gaseous losses of soil carbon (C) and nitrogen (N), and soil salt accumulation. Furthermore, synthetic fertilizers have been found to affect plant resource allocation and may lead to decreases in defensive compounds and increased herbivory (leaf eating).

Organic fertilizers include a diverse group of materials (e.g., compost, mulch, animal or green manure, peat, bone meal). Organic mulches are applied to, or grow upon, the soil surface and are the most common organic fertilizers used in urban landscapes. A wide array of organic mulching materials are used, including shredded white cedar or cypress, chipped or tub-ground hardwood or southern pine bark, pine straw, crushed cocoa-bean hulls, leaf mold, tub-ground construction debris, and compost.

Chipped and tub-ground hardwood mulch and compost are two of the most highly utilized organic mulches used in urban landscapes. Hardwood mulch is coarse, has a wide C/N ratio, and decomposes relatively slowly. Compost on the other hand, is more finely-textured, N rich, and rapidly decomposes. Both types of mulch have been found to positively impact soil properties and tree growth.

Beneficial effects of these organic
Mulches include: improved soil moisture, reduced erosion, reduced compaction, maintenance of optimal temperature, reduced salt, reduced pesticide use, increased binding of heavy metals, reduction of weeds, improved soil fertility, improved plant establishment and growth, reduction of disease.

Some potential problems with organic mulches include: allelopathy (inhibition of growth in one species of plants by chemicals produced by another species), chemical and weed contamination, disease, and N deficiency with green mulches. Current standards do not exist for application rates of organic mulches. Mulch is often applied annually to depths of 5-15 cm (2-6 inches) around the tree, but not against the base of the tree. Compost is typically applied as a top-dressing of <5 cm (<2 inches) each year.

Clients and circumstances often dictate that turf-grass remain under urban trees in lieu of mulch. Furthermore, mulch rings rarely cover the full extent of the rooting area, which has been recently estimated to be 38 times the tree diameter. Compost top-dressing applications on turfgrass show promise for improving soil quality and treating a greater extent of the rooting area. Liquid-based organic products and materials (i.e., compost tea, humic acids, mycorrhizal spores) are gaining popularity for possibly applying nutrients and organisms to soils for landscape trees. Proponents assert that these products will help retain nutrients via increased microbial immobilization, increase microbial mineralization and make nutrients available at rates plants require them, build soil structure and decrease the effects of compaction, detoxify soil and water, and suppress disease by inducing competition among disease (anaerobic) and beneficial (aerobic) organisms. Unfortunately, these claims are mostly unsubstantiated and few peer-reviewed controlled, replicated scientific studies have been performed on the impacts of aerated compost tea (ACT) and other like products on trees and soil properties.

Materials and methods

In spring of 2007 an urban soil research plot was created on the research grounds of the Morton Arboretum. The site was prepared by mimicking the activities of a typical urban site development. The disturbance was performed when the soil was saturated to maximize the impact of the disturbance. The topsoil (0-20 cm [0-8 inches]) was stripped with a bulldozer, and the underlying subsoil compacted (Image 1). A nominal depth of topsoil (3 cm [1.25 inches]) was replaced using a wheel loader and grader.

Following the disturbance, soil descriptions were performed to assess the effect of the site disturbance on the soil profile. The disturbance was uniform across the plot, and the most
dramatic effects of the disturbance were concentrated in the top 30 cm [12 inches] (Image 2). Soil bulk density of the compacted zone (0-20 cm [8 inches]) was 1.62 Mg m-3 (101 lb ft-3, compared to 1.40 Mg m-3 (87.4 lb ft-3) for the adjacent undisturbed area. The disturbed profile was wetter throughout, with increased hydric features deeper in the profile. The structure of the undisturbed A horizon (top-soil) was granular departing to subangular in the E and Bt horizons (sub-soil). The disturbed profile had platy and blocky soil structure (evidence of compaction) in the top 20 cm [8 inches].

A rectangular experimental grid with 120 square tree plots (3.05 m by 3.05 m [10 feet x 10 feet]) and 1.53 m [5 feet] inter-plot space was laid out on the disturbed area. Sixty Betula nigra and 60 Acer rubrum, two-year old, three to four cm [1¼ to 1½ inch] diameter whips, were randomly assigned and planted in plots (Image 3). These species were chosen for their ability to tolerate seasonal wetness on the site. Both exhibit chlorosis with typical urban conditions, including extreme soil pH and compaction. Birch is ectomycorrhizal (composed of a fungus sheath around the outside of root tip) and maple is endomycorrhizal (mycorrhizas whose hyphae, or filaments, enter into the plant cells). After trees were planted, the site was seeded with Kentucky bluegrass (Poa pratensis). Trees and lawn were irrigated during dry periods in the establishment year (2007). Treatments were applied May through October, annually for four years (2008 to 2012). Treatments and application rates were:

- Control, no treatment
- Aerated compost tea at 2.45 kL/100 m²/yr (600 gal/1000 ft²/yr)
- Commercial biological product applied per label
- NPK fertilizer at 1.95 kg N/100 m²/yr (4 lb N/1000 ft²/yr)
- Compost as a top-dressing of 2.5 cm/yr (1 inch/yr)
- Double-ground hardwood mulch applied to 15 cm/yr (6 inches/yr)
In-situ (on-site) monitoring was performed to measure soil penetration resistance, water content, tension, nutrient leaching and surface respiration. Soils were collected twice each year to measure soil bulk density, water content, aggregate stability, pH, electrical conductivity, phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), sodium (Na), organic carbon (C), soil organic matter, and particulate organic matter, total N, NH₄⁺ (ammonium), NO₃⁻ (nitrate), dissolved organic N, N mineralization, microbial biomass, microbial respiration, and diversity of bacteria and fungi.

Tree height, diameter, and shoot extension were measured annually. Leaf color and leaf N content were assessed periodically. In the summer of 2011, 60 of the trees were removed and biomass of shoots, roots (0-2, 2-5, and >5 mm [0-0.08, 0.08-0.18, and >0.18 inches] in diameter), were determined (Image 4). More specific information on these treatments and methods can be attained by contacting the author.

Results and discussion
After five years of treatments, we found many significant changes in soil and tree properties. The magnitude of many of these responses increased with time. For instance, changes in soil organic matter were minimal in the first two years, but were strongly significant in years three through five. Of the treatments, compost and mulch had the most dramatic impacts on soil quality. Likewise, tree growth was greatest with mulch and compost.

A summary of the significant effects we observed is as follows:

- Compared to the controls, the effects of compost on soil and tree properties included:
  - Increased plant available water
  - Decreased soil bulk density and penetration resistance
  - Increased water-stable aggregates
  - Increased cation exchange capacity
  - Increased soil nutrients (N, P, K, and Ca)
  - Increased soil organic matter, organic C, and particulate organic matter (labile SOM)
  - Increased microbial biomass and microbial respiration
  - Increased shoot, root, and total tree biomass
- Compared to the controls, the effects of the wood-chip mulch on soil and tree properties included:
  - Increased plant available water
  - Decreased soil bulk density and penetration resistance
  - Increased water-stable aggregates
  - Increased cation exchange capacity
  - Increased soil nutrients (K and Ca)
  - Increased soil organic matter, organic C, and particulate organic matter (labile SOM)
  - Decreased microbial biomass and possibly microbial diversity
  - Increased shoot, root, and total tree biomass (Acer rubrum only)
- Compared to the controls, the effects of the inorganic fertilizer on soil and tree properties included:
  - Increased soil nutrients (N and P)
  - Increased soil nutrient leaching (NO₃⁻)
Increased shoot and total tree biomass (*Acer rubrum* only)

- Compared to the controls, significant differences were not found for the soil and tree responses to aerated compost tea or the commercial biological product.

We found that improvements in soil quality were important and likely responsible for the observed increases in tree growth. We found no changes in soil pH, electrical conductivity, Mg, Na, texture, or soil color among the treatments. Most soil properties were significantly and positively correlated with above- and below-ground tree biomass.

Our results confirm many of our hypotheses derived at the onset of the research. We hypothesized and found that compost and mulch would have significantly greater impacts on soil physical, chemical and biological properties compared to fertilizer, aerated compost tea and the commercial biological product. Compost being relatively labile and nutrient-rich, is known for its many positive impacts on soil organic matter and organisms. Our findings confirmed the hypothesis that improvements in soil biochemical properties would be greatest with compost.

We found mulch to be a stronger surface buffer and have greater impacts on soil water, and also impact many soil properties, but at a slower rate than the compost treatment. We hypothesized and found fertilizer to increase availability of soil N and P, but also found increased NO3- leaching with this treatment. We confirmed our hypothesis that the effects of aerated compost tea and the commercial biological product would be minimal due to the relatively small amounts of organisms and nutrients being added in these treatments compared to the other treatments and also background soil levels.

We only found increases in tree growth with compost, mulch, and fertilizer (Image 5). Our hypothesized mechanism for increased tree growth was an improvement in overall soil quality. Our results confirm that no specific soil property explained increases in tree growth better than a model that included a combination of soil physical, chemical, and biological properties.

An economic comparison of these treatments was performed by evaluating the costs for equipment, materials, labor, and transportation. Of the treatments, mulching and compost were the cheapest at $17 and $22 per kilogram (kg) [2.2 pounds] of tree biomass gained. Fertilizer costs were $27 per kg of tree biomass gained. The aerated compost tea cost $34 per kg of tree biomass gained, and $117 per kg of tree biomass gained, if the cost of the brewer is included. The commercial biological product cost $57 per kg of tree biomass gained.

**Acknowledgements**

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Bryant C. Scharenbroch, Ph.D., is an urban soil scientist at The Morton Arboretum in Lisle, Illinois. Gary W. Watson, Ph.D., is senior research scientist at The Morton Arboretum. This article was based in part on Scharenbroch’s presentation on the same subject at TCI EXPO 2012 in Baltimore. To listen to the audio recording of that presentation, go to the digital version of this issue of TCI Magazine online at tcia.org/publications/tci-magazine/archives and click here.
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Though it started slowly, the 1990s would become a prosperous decade in the United States, and at the very start of the decade, two initiatives would lead to great things for the National Arborist Association.

By David Rattigan

In the June 1990 inaugural issue of Tree Care Industry Magazine, Publisher Robert Felix, wrote, “The start of this new decade brings an abundance of opportunities for the tree care industry to move into public focus.”

As with many things, Felix, by then executive vice president of the National Arborist Association (now TCIA), would prove to be correct, about both the awareness and concern for the environment. Felix noted that President George H.W. Bush had proposed an “America the Beautiful” program that included $175 million to plant and care for trees, and Felix speculated about the role of the arborist in that movement. The new magazine would play a role as well, Felix wrote, providing the information on new technology, business, and examples of professionalism that would help its readers – NAA members in particular – stand above others in the industry.

In the mid-1980s, the association made a concerted effort to build its cash reserves, and in the late 1980s used the cash to launch the new initiatives. In 1990, the NAA decided to bring two projects in-house, giving birth to TCI Magazine and the Tree Care Industry (TCI) EXPO. The magazine debuted with the June issue, and the first TCI EXPO took place in Richmond, Virginia, in October, sponsored jointly by the magazine and the International Society of Arboriculture.

According to the NAA Reporter, the association’s monthly newsletter, the first TCI EXPO drew 624 arborists representing 340 firms and organizations from 39 states. “We had one tree magazine at the time, Arbor Age, and that was run and owned by Denny Goldstein. He put on a trade show as well,” says Richard Goforth, vice president of Southco Industries, Inc. of Shelby, North Carolina, and one of the...
association’s first associate members. “I was one of the directors of the NAA, and I said, ‘Bob, there isn’t any reason we can’t do that, and cut Goldstein out.’ Because that’s what he did for a living – he wasn’t in the tree business and he could care less about the tree business. So, we decided we’d give it a whirl. We started out small, just like the NAA did.”

That decision would reap great benefits for the association, which had been founded in 1938 and in the late 1980s had seen large gains in its membership. From a membership of 338 in 1980, the elimination of peer review and a reduction in the price of membership dues resulted in a jump in members to 1,149 in 1990.

“We felt there was a need to communicate with a broader audience to achieve our goals of greater professionalism in the industry,” recalls Peter Gerstenberger, the staff arborist who became the magazine’s editor. “As a tactic to change the industry, we had to have a way of reaching them, not simply our membership, which was a relatively small number of companies. The two initiatives were related. The conventional wisdom from other industries and other professions was that a trade magazine and trade show went hand-in-hand. Typically, the magazine hosted the show.

“It was a smaller jump than it would appear, in that for many years we were already participating in a trade show, called Arbor Expo, and were making regular contributions to the magazine Arbor Age,” Gerstenberger adds, noting that the association was already providing photos and significant editorial and educational input to both of them. “We got to the point where we outgrew our role.”

Given that growth, taking the trade magazine and EXPO in-house was a natural move for Felix and the association. Once that leap was taken, however, it was incumbent on them to continue to grow the association – the better to sell magazine ads and boost trade show attendance.

Brian Barnard, a recent graduate from the forestry program at Michigan State, was hired as staff arborist in 1990 and was one of six staffers working in the association office.

“It was phenomenal,” recalls Barnard, now division manager for Midwest Arborist Supplies in Grand Rapids, Michigan. “The magazine definitely helped, and the EXPO was a huge success. I think it surprised everybody how many good, quality, eager young tree companies that were out there that maybe even the old-time tree company owners never knew were there. We all kind of grew together through the ‘90s.”

By 1995, membership was up to 1,526 and growing. By 1999 it was up to 2,633, and by 2000 it had peaked at 2,958.

“When we took off with the magazine, we purchased mailing lists, cajoled mailing lists out of several of our friends in the vending world – the chipper manufacturers, truck body manufacturers, etc. – and cobbled together a mailing list that was probably 10 times, at least, the size of our membership base,” Gerstenberger says. “Our goal was to reach as many commercial entities as possible, so we massaged and pared that list to emphasize reaching those companies. Our message instantaneously went from 1,149 companies to a

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This is the seventh installment of a monthly series on the 75-year history of TCIA and the state of the tree care industry during those years. Previous installments include:

Part 1: “Tree Care Prior to the Founding of TCIA,” April 2013
Part 2: “The Birth of an Association, the War, and the Post War Boom,” May 2013
Part 5: “The ’70s: A Time of Change For the Science of Tree Care, the Equipment, the Country and the NAA,” August 2013

The series will culminate with the November TCI EXPO show issue and our 75th Anniversary Celebration and Museum at TCI EXPO 2013 in Charlotte, also in November.
number easily in excess of 10 times that. Today our mailing database is probably 26,000 to 27,000 entities.”

The association was growing in other ways as well, building on momentum in other decades. As its influence expanded, the association continued to develop and revise its educational programs and took a lead in developing standards for the industry, as well as serving as its voice in Washington, D.C.

The 1990s was a strong time for the tree care industry, and a dynamic decade for its professional association. It featured continued progress and growth, which continued despite the loss of its leader later in the decade.

Innovation and prosperity

The 1990s opened with The Gulf War and ended with what was called the longest period of peacetime economic expansion in U.S. history under President Bill Clinton. Clinton was a central figure in trying to bring peace to foreign countries, to decrease climate change, and adopting the North American Free Trade Agreement, although he may be best remembered for a scandal with an intern.

The world witnessed the thawing of the Cold War and the dissolution of the Soviet Union. In the United States, the decade brought a societal debate about assisted suicide and abortion, and terrorist acts on U.S. soil with the 1993 World Trade Center bombing and the bombing of the Murrah federal building in Oklahoma City in 1995.

With the help of fertility drugs, an Iowa mother gave birth to septuplets in 1997. In the United Kingdom, Dolly the sheep was cloned in 1997, and genetically engineered crops were developed. The Human Genome Project gave scientists better understanding in one direction and the Hubble Space Telescope gave them better understanding in another. The decade introduced the Global Positioning System (GPS), and portable CD and MP3 players. The Internet got faster, leading to more use of email and the expansion of e-commerce.

Pixar released Toy Story, which revolutionized animated films, and Titanic became the highest grossing film of all time at $1.8 billion worldwide. On television, the medical drama ER launched the career of George Clooney, and MTV introduced the “reality show.” A baseball strike in 1994 cancelled the World Series. The first Harry Potter novel was published.

At the same time, tree care professionals were definitely making advancements in technology and equipment. Companies were modernizing their operations with computer software in the office, and with updated equipment, techniques and training in the field.

“As an industry, we started hitting a stride and becoming more of an industry,” says Dave Scharfenberger, president of accredited member Wachtel Tree Science in Wisconsin. “Along with having more tools for the climber to use, there were more tools for production (on the ground). Chippers got bigger and better, they got more reliable. We started getting bigger machines, better machines, safer machines. The equipment really started coming of age and people started spending money on equipment. Also, newer fungicides and insecticides started becoming available to us. They cost more, but you used less of them, and they had less environmental impact.”

One of the major changes came in the area of climbing, where new braids, synthetic fibers and rigging tools were introduced to the industry by its best climbers. Along with the huge variety of products to choose from, there was a shift in philosophy and a new emphasis.


“They announced to us on the evening of the climbers’ meeting, which is the evening before the climbing competition, that there were some new rules,” Palmer recalls. “Safety was king. They even referred to it as ‘The S word,’ at that point. So we had to be fall-protected all the time. Prior to that, three-point climbing was not only acceptable, it was common practice. In other words, people just climbed a tree, and then they’d just tie in before they went
The changes in competition rules got Palmer and some of the other climbers, who came from a mountaineering background, to collaborate on safer climbing techniques, rigging devices and other equipment. They also studied techniques from loggers, who were expert with chain saws. The innovations of competition climbers like Palmer, Tompkins, Butch Webber and Bill Moore were passed along to others in the industry through seminars, field days and other educational programs.

“A whole different level of problem solving and innovation was set in motion,” Palmer says. While revisions to the ANSI Z133 Standard weren’t adopted until 2000, there was a shift in thinking and new practices that developed through the decade. As Palmer says, “safety and productivity should be two sides of the same coin.”

Arborist certification, which had been the practice in some states as far back as 1937 in Massachusetts, was initiated by the Western Chapter of the ISA in the mid-1980s, and then adopted by the ISA on a larger scale in the 1990s. It was a voluntary credential, but became an important one.

“It was an immensely successful program,” says Donald F. Blair, arborist and historian, who recalls that some municipalities started putting a requirement in their bid specifications that arborists be certified. In some states, such as Blair’s home state of California, municipalities were also passing heritage tree ordinances that became planning tools while protecting valuable old trees.

“The cities that have adopted the heritage tree ordinances – I think I can extend this all over the country but my experience is particularly in California – the real estate and property values are absolutely the highest in the communities that have the most stringent heritage tree ordinances,” Blair says. “It’s where people want to live.”

As it had in previous decades, the industry used a public display of civic-minded volunteerism to build awareness of the value of trees and proper tree care, with a day of service at Arlington National Cemetery in 1993, and another in 1998. According to the NAA Reporter: approximately 400 arborists brought chain saws, chippers and bucket trucks to the cemetery, which is more than 600 acres, to prune it up before Veterans Day in 1993. Five years later, that number had increased to 600 arborists from 80 member companies in 20 states.

“We called it the Arborist Day of Service,” Gerstenberger recalls. “It was a means of giving back in a significant way to the country, and also of gaining recognition for the profession. We certainly didn’t discount the fact that at the time, on any given Saturday, Arlington National Cemetery expected something like 10,000 visitors.”

“That was an exceptional day,” says Blair, who recalls that on the first “National Day of Service” an industry transaction was creating a major buzz, as Asplundh Tree Experts bought several assets belonging to Southeastern Public Service Company, smaller companies which it had absorbed.

“The buzz was, Number 1 just bought Number 2,” Blair says. “That’s when Asplundh experienced exponential growth.”

The arborists participated in the day of service twice at Arlington. Recognizing the value of better tree care, the cemetery procured a budget and staffing to do their own work, and contracted for tree work (hiring an NAA member company).

“We essentially became a victim of our own success,” Gerstenberger says.

The association had tuned in to the environmental awareness and concern that Felix referenced at the beginning of the decade, participating in or partially funding studies on the disposal of wood waste and integrated pest management (IPM), according to Richard Campana’s book Arboriculture: History and Development in North America. Staffers attended the 1993 National Youth Environmental Summit in Cincinnati to deliver the message that arborists are pro-environment, and that professional tree care was essential for a healthy urban forest.

Public interest in the environment created a customer who had better appreciation for the trees on their property. For association members seeking to separate themselves from less skilled labor – what arborists call “the guy with the chain saw and pickup truck” – it was a welcome seg-

**What It Cost in the 1990s**

While most things went up during the decade, gold actually started 1990 at $383.51/ounce and ended 1999 at $298.98.

The price for a gallon of gasoline makes an interesting study. Instead of saying that a gallon of gas cost 10 cents in 1938 (founding year of TCIA), when adjusted for inflation across the decades, the cost in today’s dollar was $3.31; 1998 was less than half that at $1.46 and, for comparison, 2013 currently averages $3.51, which is more than 1938 and less than the price in 1918 (3.87).

The wage average rose from $28,970 to $40,810.

Averaged out over the decade, the cost of a new home was $127,000.

A cellular car phone cost $325 and it stayed in the car.

The cost to buy a car rose from $16,000 to $21,000.

Averaged out over the decade, 99 cents could buy you any one of the following: 1 pound of apples, hamburger, frozen sweet corn or peas, a gallon of milk, 5 lbs. of sugar or two cans of tuna.
ment of the market.

“There was a change in the customer base where they became more educated,” says Scharfenberger, a veteran of the industry since 1976, who bought Wachtel (a founding member of the NAA) with Paul Markworth in 1994. “When I look at the size of good companies that are out there now compared to what it was in the ’70s, the difference is pretty staggering. And they haven’t all been done at the same dollar-per-hour rate, with the same equipment and so forth. So, I think there were fundamental changes in the marketplace that helped our industry grow.

“The educated customer is looking to keep their trees growing and healthy on their property,” Scharfenberger says. “They see the value in their trees and they want to take steps to protect their trees. A lot of our clients only have two to five trees on their property. All of a sudden, each tree becomes important to them.”

Of course, there is always more than one way to climb a tree, and another personality who, in Blair’s words, “shook up the industry” was Dick Proudfoot. The Portland, Oregon-based Proudfoot had been a used car salesman and entrepreneur. As president of Pruett Tree & Landscape in Lake Oswego, Oregon, a Portland suburb, he got involved in the association, and eventually served as president in 1997.

“He applied used car techniques to sell tree work,” Blair recalls. “It bugged Bob (Felix) to no end. His guys would actually tell the client, ‘Now what’s it going to take to get you to authorize this job today? What are we going to have to do?’”

In addition to running his businesses, he gave seminars on sales. Blair recalls watching one, when Proudfoot used a bacon-and-egg breakfast to help define the difference between interest and commitment.

“He said, ‘A chicken has an interest, a pig has a total commitment,’” Blair recalls.

Sudden change at the top

Felix was described by most as a well-liked, dynamic, hands-on and innovative leader who had taken over the association at a tenuous time in the early 1970s and into the mid-1990s had impressively built up its membership, finances, and influence.

“He knew all the people and he was really good,” says Jeanne Houser, at that time a vice president for Philadelphia-based McFarland Landscape Services, Inc. and a member of the association’s Board of Directors.

The association had even opened an office in England. It was shortly after a visit to the UK when Felix suffered a heart attack, on Sept 23, 1996, and died at age 62.

“It was just before EXPO,” recalls Pat Felix, his wife and the association administrator at the time. “The staff was great. I said, ‘We have to make this (EXPO) great so the industry knows the association is strong and will continue.’ I said, ‘Just follow Bob’s book.’”

While things ran well from the outside, those who were there recall turmoil in the office and the boardroom.

“We were just rocked to our core,” Gerstenberger says. “From the board all the way through the membership, everybody was left stunned and wondering ‘what do we do now?’ The board had (many) emergency meetings and they formed a search committee. It was to their credit that they took the responsibility and saw the need to do that.

“Formerly, they’d always been led, quite capably, by Bob Felix, so you never really got a sense of their ability to really lead themselves until that point,” Gerstenberger says. “Leaders came forward.”

A scholarship fund was set up in Felix’s name. He posthumously received the association’s Award of Merit. Don Blair recalls two incidents that he says could not have been more fitting and proper at the graveside service for Felix in Wolfeboro, New
"Among the mourners’ vehicles was a well-worn tree truck," recalls Blair. "Then, as Bob was being laid to rest, off in the near distance was the sound of chain saw and chipper. Taps would not have been as appropriate at the time."

Over the next few years the association relied on interim leaders Barry Cullen and then Amelia Reinert, then turned day-to-day operations over to its management team with oversight by Mark Tobin, a member the Board of Directors.

Tobin was CEO of Hartney Greymont of Needham, Massachusetts. Once a week he’d drive to the NAA office in New Hampshire to chair a staff meeting to determine the tasks and priorities for the week.

"I think it was helpful for everybody," Tobin recalls. "They had talented, professional people, and they did their jobs. In a sense, in that (period) before Bob’s sudden passing and then getting Cynthia (Mills) on board, we didn’t have a lot of giant initiatives. The association ran really well on a day-to-day basis, but it was in a holding pattern for long-term improvement (and) change... we were really ready to jump forward and get back on the growth and new initiative movement."

In 1999, a search committee found Cynthia Mills. Her background was not in tree care but from professional association management. She impressed the board and staffers alike with her business acumen and leadership skills.

“She came in and was very competent,” Houser says. “She knew her business. She wasn’t an industry-specific person, but she’s very smart and picked it right up. She knew how to run an association. She knew how to delegate and hire people, and get the job done that needed to be done.”

“It felt so good to have stability, finally, leading the organization,” Gerstenberger recalls.

As it entered the new millennium, the association was again ready to build on past successes to make future gains for its industry and members. Lying just ahead under its new leadership would be a name change, adoption of Accreditation, a reinvigorated push for safety and a need to adapt to a digital world.

Cynthia Mills came on board to lead the NAA in 1999.

Name those icons!

From page 28, iconic ‘90s images are, top row from left: Napster music file sharing service; AOL Internet service provider; MYST video game; Beanie Babies stuffed animals fad; Jurassic Park movie; Beavis and Butthead MTV characters. Center row: Branch Davidsions fire in Waco, Texas; Timothy McVey, Oklahoma City bomber; John and Carolyn Kennedy; Magic Johnson and Michael Jordan; O.J. Simpson. Bottom: Kurt Cobain of Nirvana; Bill Clinton and Monica Lewinski; Norman Schwarzkopf, Jr. during the 1st Gulf War; Kerri Strug 1996 Atlanta Olympics champion; Dolly, the cloned sheep.
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Given its capabilities, the articulated (or knuckle boom) crane doesn’t always get the attention it deserves in tree care. However, it’s really a technology that bears some consideration.

The first thing we need to do is to agree on some terms. In a pure definition, the knuckle boom is generally one that has a single joint about halfway along the crane boom; an articulated boom can have one or more. Because the terms are used interchangeably in the business, for the purposes of this article, we will do the same. These cranes are designed to lift and place materials. Conversely, devices such as tracked lifts and atrium lifts are not designed to lift or move material.

Similar in some ways to the look and function of other cranes, articulated booms feature one or more joints or “knuckles” which allow the crane to fold like a finger; hence the name knuckle. You can find versions of them on everything from forestry trucks to log loaders.

The articulated boom is intended to be compact when folded, stored folded for transportation and when not in use. Many have telescoping upper booms for added reach.

In arbor care, you can find the articulated crane mounted behind the cab and forward of the truck body. This configuration leaves the payload area open and easily accessible from three sides, and for dumping. The amidships location also more evenly distributes weight along the length of the truck chassis.

Another configuration, usually employed with larger material handling is at the end of the chassis, behind the truck body or materials area. Additionally, a rear-mount allows the crane to have better reach off the back of the truck.

Another distinction needs to be made at this juncture. You will see articulated cranes used in construction; these types are NOT intended for arbor use. They are, as one manufacturer explained it, best suited for one-time assignments, such as placing large air conditioning units atop buildings. Contrast those with articulated boom cranes used for production work, such as lifting a truck load of takedown into a truck body or large tree chunks into a chipper or grinder. The latter articulated boom cranes are intended to withstand the rigors of repetitive cycling.

According to Lou Holena in the sales department of 16-year TCIA member Royal Truck & Equipment, Inc. of Coopersburg, Pennsylvania, what tree care pros use the articulated boom for typically is as a grapple crane for lifting and lowering material.

“We build a number of custom truck bodies for tree care, the majority are used trucks refitted with new boom equipment.
For most part, we get in trucks with a utility body, for example an electric company. Customers will want the articulated crane along with a dump body or forestry body installed as an inexpensive way to get what is essentially a log loader,” he says. He warns that, “The knuckle crane is not meant for days of loading logs. That is best left for big forestry and land clearing cranes built to run all day.”

“Knuckle-type cranes are meant to unfold and be able to load a truck in 20 to 30 minutes, making them a nice solution for the smaller user, especially so since there also are many reasonably priced ones on the market,” Holena adds.

“Right now we use only Palfinger’s Epsilon grapple cranes. This is an Austrian-based company which has a 70 percent share of the European market overall and 50 percent of cranes used there in arbor care,” he maintains.

“The two smallest models we offer can be used on single-axle trucks, typically used by smaller businesses like father-son operations. We also do the larger ones capable of servicing utility poles in country settings and one we did is used in Florida to reach into and clean flood canals,” Holena says.

Holena concurs that while the classic knuckle boom is one that folds once, like a pocket knife, there are multiple articulated types including those that fold twice inward on themselves or those featuring a Z-fold.

Holena notes that a typical articulated boom will last about 50,000 to 100,000 cycles (a cycle starting at the lift point, moving to the drop/cargo area and returning to the starting point). Epsilon loaders are designed for 630,000 cycles without getting cracks on structural components, which translates to working four hours a day, 250 days a year for six years before getting any problems on booms or cylinders. “That kind of environment would kill a normal crane in a few months,” Holena states. The Epsilon line includes L-fold and Z-fold cranes. (Check out YouTube royaltrucksales for a very good demo of how articulated booms function.)

According to Holena, the Z-fold, though new to the U.S., is a standard in Europe. “It is used heavily in cleanup, and from small tree care businesses up to short of land clearing.”

Tom Zwickle, business unit manager-Epsilon for Palfinger North America, says, “When you talk to forestry guys, a knuckle boom is one huge piece of equipment used to load log-length trees onto a trailer or to run them through a de-limber. That is a very large type knuckle boom crane. The other is what we call loader cranes, cranes that have a log grapple on the end,” he says.

Most popular among tree care professionals, the latter can be used to load log-length pieces into a truck body to be re-sold as lumber or processed in ways other than a chipper, such as a grinder, for
We recently sold the New York City Parks department 10 units. A couple of years ago a tornado went through Queens and the city did not have the tree service equipment. So the knuckle booms were bought for that use… to pick up debris and large items left on the ground,” Zwickle says.

“The difference in this line is that the longest reach is 31 feet. You can do take-downs, but that work may be preferable to do with a 60- to 70-foot articulated boom crane with a winch. The class of knuckle boom I am talking about for the tree care business can do some standing timber, but is best for material on the ground,” he adds.

“For tree care, the Epsilon is Palfinger’s most popular. This series we call loaders versus knuckle booms per se in that they...
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are manufactured for continuous side-to-side loading. The other knuckle booms are designed for piece work, to go out distances, designed to deflect (flex) to accommodate a lot of weight, but not in continuous operation,” Zwickle says.

“The loader-type is built for guys lifting trees to go side-to-side, drag and pull and be stronger in the production environment. They work best close-in to a truck and are built for more continuous duty cycles. We have customers who load chippers with these, then load logs from the same job.”

Continuing, he says, “A standard knuckle boom would not hold up in a continuous environment. They might look the same (as the loader-type), but they are built differently with different components.” One major difference, he points out, is that the hydraulics that run the boom-end grapple run inside the boom on the loader-type, which protects them from snagging and falling debris.”

“We find that some guys still like to sling the tree material and bring it in, but in reality the future is in using the grapple,” he maintains. Zwickle notes that there is extra work to be had by being able to change the grapple head for different applications, such as rocks, metal waste and scrap.

“The guys in tree care like to keep trucks smaller and to put on a smaller boom to save weight and to keep the truck size down for getting around residential areas. The beauty about trees is that the load can be cut into smaller lengths,” he says.

In terms of costs, a typical knuckle boom loader as he describes is in the $45,000 range, but “this is very subjective,” according to Zwickle. “Tree guys like unique, customized equipment and they have certain tastes. Sometimes that involves specific truck bodies and fabrication.” He says to figure around $70,000 for the knuckle-boom loader and body.

Regarding certification and licensing, “We run certification classes for buyers of very large knuckle-boom cranes, for example those used for loading shingles on a building, but right now, most knuckle-boom configurations for tree care are exempt,” he maintains.

Dustin Yost, market manager for Altec Industries, explains that Altec became a distributor of the Italian-made PM Articulating Cranes in 2012 to satisfy customer requests for this type of machine.

“As a knuckleboom-crane dealer, we perform the installation of the machine and body onto the truck chassis. With PM, we have a wide product line of traditional (two articulation) cranes that we pair with our own manufactured bodies to suit nearly any application or customer specification.”

“The biggest advantage to these cranes is their versatility. With the compact design, and capability to fold up behind the cab, we get the weight balanced so there is still adequate payload capacity on the truck,” he says.

The other versatility advantage of an articulated crane is to put various attachments on the end, such as grapples, jibs and work platforms. We are seeing increased interest in both jib and grapple

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use in tree care,” he notes.

Yost says that articulating cranes with jibs provide a third articulating section that can actually go up and over a house, which can be critical for takedowns and removals in difficult areas.

He adds that articulated cranes use sophisticated proportional hydraulic controls and radio controls that help the operator safely and accurately position the crane for attaching rigging to trees. “Several customer have explained to us the benefits of smooth operation and radio remote controls in this application,” Yost says.

According to Yost, PM offers 46 product families with more than 300 individual configurations, sufficient for virtually any application.

He points to the various size classes ranging from 1.5 to more than 100 metric tonne meters (11,000 ft-lbs to more than 70,000 ft-lbs).

For TCI EXPO, Yost says, “Altec will be showcasing an articulating crane built and configured specifically for tree care applications. It is a PM16523S with log grapple and top-mounted riding seat. It will feature a 16-foot chip/log dump body with removable top, mounted on a tandem axle Freightliner M2-106 chassis. This is a very versatile configuration we believe will appeal to residential tree contractors and municipal customers doing their own tree care.”

When asked what he sees as key features tree care professionals would be looking for in a knuckle- or articulated-boom crane, Yost says, “I believe the answer to be versatility. Knuckle-boom cranes allow customers to get multiple uses out of one machine, and the strength-to-weight ratios and ability to stow compactly maximize the effectiveness of the truck chassis, according to Altec’s Dustin Yost.

Given their performance characteristics contrasted with cost, the knuckle boom crane might be considered something well within reach for any tree care company.”
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When Orvin “Big ‘O’” Kiser applied for a business license to remove trees blown down during a freak ice storm in 1979, he chose his company’s name on the spur of the moment, assuming he would only be in business until all the fallen trees had been removed. Little did he know that Big “O” Tree & Lawn Service Inc. would still be thriving how many years later.

“People are always asking about the name,” says Julia Davis, who began working for Big “O” in 1997, as soon as she received her degree in forestry. She was 40 years old.

“It became apparent that tree care was a younger person’s job,” Davis says. She worked in sales before becoming operations manager in 2000. She also does all the tree and shrub spraying.

Kiser is the president and owner of the company. The office, in Stuarts Draft, Virginia, serves customers in Charlottesville as well as portions of Albemarle County and the Shenandoah Valley. Eighty-five percent of their business is residential. The remainder is commercial and institutional, and includes the City of Charlottesville, the University of Virginia and James Madison University.

Some of the trees in the area are very old, especially the ones on old estates, Davis says. Helping clients decide whether they should be saved or removed is one of the company’s specialties.

“Most people really want to save their trees,” she says. “We try to protect and preserve them, but we also try to let people know they have a life expectancy.”

Their plant health care (PHC) program is a preventative program for trees, woody perennials and shrubs. The crews monitor customers’ properties and diagnose tree problems such as insects and diseases, nutrient deficiencies and potential tree hazards. They also make sure their customers’ cultural practices, such as irrigation, aren’t harming the trees.

The program includes a monthly report on the health of customers’ landscapes as well as a landscape map to keep track of the plants’ needs.

Big “O” prunes to improve the structure of trees, to restore damaged trees and to improve views, as well as for crown cleaning and aesthetics. They apply insect growth regulators and perform soil tests before fertilizing to ensure that it’s necessary. They diagnose insect and disease problems, and send samples to a lab at Virginia Tech for their opinion when necessary.

They mulch with wood chips, preferably from the prunings of the tree. “Often the best treatment for old trees is to remove the turf around them and put down two to four inches of mulch,” Davis says.

They do cabling and bracing with traditional systems when trees need more stability and with the Cobra system when they need more flexibility. They also do root-collar excavations, which can be very educational for their customers, she says. “It’s very interesting. You get to see an awful lot about what’s going on in a root system in a very short period of time.”

When trees have to be removed, Big “O” does the removals and the stump grinding. They also continue to do the company’s original service – emergency storm work.

Approximately 75 percent of their business comes from satisfied customers and their referrals. Some customers have been with them for close to 30 years. They advertise online and on the radio.

“We listen to our customers and we also try to educate them,” Davis says. “I can’t stress too much that a knowledgeable customer is our best customer. You should be able to explain why they would want our company to do this or that for their tree. Then they can make a better informed decision.”

The company has seven employees in the field, five of whom are ISA-certified arborists. Many are very long term. One of the perks of being an employee is the company’s profit sharing plan.
“We want people to be happy and to be part of the company,” she says. “I think Orvin’s philosophy is that you treat your employees with respect and dignity and they will give you back tenfold. He’s very conscious of the difficulty of the work, too.”

She adds, “It really is a very good group of employees. I’m very proud of the quality of the work we do. I am very, very proud to know that when we leave a property it looks better than when we arrived.”

Big “O” earned TCIA Accreditation in 2005.

“I’m competitive,” Davis laughs. “I wanted to be the first in the state. Sadly, we were the second – but the first in the southern part of the state.”

There are certainly benefits of Accreditation for companies that want to be around for a long time, she says. For Big “O”, it was less to increase the company’s visibility and stature in the business than for their own sense of well-being and pride – and peace of mind in case they are ever audited.

The process took about six months. “I was the driving force,” she says. “My co-workers were very helpful, but I was on a mission.” She had help getting the company building up to code and ensuring that all the regulations were being followed.

They especially learned better record keeping. They already had a budget, a business plan, and knew all the state regulations. They were very serious about safety and were changing out the vehicles and equipment on a five- to seven-year plan.

“But it was all in Orvin’s head,” she says. “He’s an excellent numbers man, but we had no documentation. I spent a lot of time at the copy machine.”

And where does she see Big “O” in a few years?

“I see us steadily increasing our bottom line,” Davis says, both the company’s and, because of the profit sharing, that of the employees. Because everyone is so safety conscious, Big “O”’s insurance goes down and they get a break on workers’ comp; they attract good employees who attract customers and more good employees.

“Everything just steamrolls,” she says.
Heading, Topping and the Pruning Standard Revision

By Cass Turnbull

I’m a big fan of the American National Standards Committee (ANSI) A300 pruning standards. I remember the time before we had ISA certified arborists and A300 standards. It was the Wild West for trees and the cowboys dominated the field. Tree topping was synonymous with tree pruning and it occurred everywhere, all the time, without challenge or recourse. If you hired a tree service to prune your tree, and they topped it instead, you were fresh out of luck.

These days the public has ways to find knowledgeable tree workers and can have them bid apples to apples, instead of tree pruning to tree topping. If the tree service tops instead of prunes, you can sue and prove that they did not prune according to the bid-specified standards. I love the A300s. I refer to them in my pruning book, during the presentations I give to the public, and in interviews on radio, TV and in print. I am engaged in these activities as the founder and president of a non-profit, PlantAmnesty, whose sole mission is to end bad pruning. The theory, science and practice of pruning are things that I have spent a great deal of time thinking critically about. I also prune for a living, in my other life as a gardener and arborist. This year the A300 Pruning standard, last updated in 2008, will be under review, and given the recent spate of print articles and PowerPoint presentations extolling the virtues of various acceptable instances of topping and heading, I have developed some concerns. What follows are proposals for a few additions, omissions, definitions and descriptions that I think would improve the document. Like I said, I do a lot of thinking about pruning.

Heading and topping

The current A300 Part 1 definition of a heading is “the reduction of a shoot, stem, or branch back to a bud or lateral branch not large enough to assume the terminal role.” I consider that phraseology to be one of the four great advances in arboriculture in the past three decades. The other three being the (Shigo) CODIT model, (arborist) certification and the A300s. They easily could be considered the top four advances in the past 100 years. I ask that this definition remain as is and not be changed. I’m also concerned that by trying to accommodate “exceptions” to the no topping rule, the standards will become useless in practice. Far from “the exception proves the rule,” I assert that, if incorporated, exceptions will “break (the rule).”

Exceptions to the no topping rule

By exceptions to the no-topping rule, I am mostly referring to “retrenchment” pruning for old, historically significant trees. But there are numerous other “exception” examples such as fruit-tree rejuvenation, re-topping unsafe trees, and topping, heading and reduction pruning to create a living “habitat” tree. I have written about these and listed them myself. Many of them make sense, others are entirely bogus, and some are borderline acceptable practice.

The problem is that if we acknowledge them, it will quickly become open season on trees. This is because, over most of our history, people have been acting on their subconscious compulsion to tame trees by topping them. There is no other profession like ours. Customers actually request that bad things be done to their trees. Can you imagine a car owner telling the body shop that he wants the car dented and please break the windows? Or a construction guy asked to roof the house in cardboard? How about, “please amputate my arm, just in case it is infected.” Well, when your customer asks you to top the tree to make it smaller and safer, he is asking you to harm a tree for no good reason, and it is likely to backfire. Why do people think their tree is “too big?” Nobody knows.

This is why saying it is “OK to top, head and reduce an old historic tree that is already in failure mode” will quickly become, “OK to top a tree that we think is dangerous.” Then we are back where we started! And, any sort of general statement, such as “occasionally an experienced arborist may need to top or head trees under special circumstances” won’t work either. Everybody thinks topping, heading and crown reduction is bad, except when they do it. Then it is correct and clearly justified.

The following is a partial list of paraphrased and out-of-context statements made by leaders in the industry. Let me emphasize that these statements are paraphrased, extrapolated and taken out of context, which is what happens in the real world and why we need to be so careful not only in what we say, but in what people hear:

- It’s OK to re-top a hazardous tree to make it safe. I promise to come back to check it out in the future.
- It’s OK to top a large Douglas fir for a view if there is no target.
- It’s OK to top a tree if you plan to take it out in a few years, and you have already planted the replacement.
- It’s OK to top, or re-top, if you have a good reason, you know what you’re doing, and you don’t do it very often.
- It’s OK to top a middle-aged tree for a view if you top to an old node with an epidemiccic shoot, and promise to come back every few years.
- In our country we top trees every 20 years and we believe they live longer because of it.
- Topping and reduction pruning on a very old, well-loved tree that has a target, and is already in failure mode, is OK. We will watch it closely.
- Reducing the height and size of a tree reduces the torque of a tree and can prevent failure.
- I live in the real world and if the cus-
customer won’t let me take the tree out, I need to top or head it to make it safer, to allow more light into the yard, or to create a view.

- The A300s must accommodate common tree care practices.

Do we really want these to become the new standards? It begs the question, if all these exceptions are OK, under what circumstances is it not OK to top a tree?

Deciding how to accommodate exceptions presents a very difficult challenge to the A300 Committee. So what is the A300 Committee supposed to do about the occurrence of exceptions to the no-topping rule? I suggest they simply do not address it. Like the Supreme Court, they can just not take up the case, and let it work itself out in the field.

Heading

My second concern deals with heading that is not large enough to count as topping. Not much is said about it in the current standard except that it may or may not be acceptable practice. I suggest that the size of cuts (described in years, not inches) be used to give names to the kinds of heading cuts. And then the most common acceptable uses of heading could be defined and the general use of heading, eschewed.

All heading cuts are bad for the health of trees, as Alex Shigo clearing demonstrated. It is worse for the tree the bigger the cut and the older the wood, like a topping cut. Heading also creates watersprouts, which are dangerous if left to grow very large and are a real nuisance as they keep coming back with exponentially greater numbers if they are pruned off. And, after being headed, trees actually increase their rate of growth. Smaller heading cuts do little internal damage to trees but they do cause watersprouts, which grow quickly to the size the tree was before heading. Watersprouts also destroy the beauty of the natural branch structure.

Trees being used as an amenity, which is to say, because we like how they look, should not be ruined in the always-unsuccessful attempt to make them shorter or tidier – the two main reasons arborists are asked by consumers to head trees. Heading doesn’t really do either of these things. It does, however, create a maintenance nightmare, often leading to what I call “accidental pollarding.” The customer who agrees to or who requests heading of trees rarely understands the consequences. It is up to the arborist to provide only services that work. Doctors who provide prescriptions or surgeries just because it is what the customer insists on are considered unethical. Arborists should take their cues from the medical profession and only do things that truly benefit the tree and owner, or at least do no harm.

I would like to see the section on heading expanded. I think that wording such as, “Heading trees shall be avoided except for cases of specialty pruning and structural pruning,” should be used. And I would continue with the following definitions or something similar:

- Specialty or Formal Pruning – The heading cut is correctly used when trees are planted for special effect in formally designed gardens. In all instances, training starts when the tree is young, annual maintenance is planned for the life of the tree, and species are selected for their ability to accommodate such pruning. All heading cuts are small, either tipping or shearing. Examples of formal, specialty pruning are espalier, coppicing, topiary, pollarding, pleaching, and Japanese “cloud pruning” of pines.
- Training – Pruning done on young trees.
- Young tree – A tree less than 15 years

Figure 5.3.8 shows removing a branch with a narrow angle of attachment. Here, again, the lateral appears to be one-half to two-thirds the size of the parent stem. That would certainly work if it were a young tree, but could be prohibitively damaging if it was a large cut on a mature tree.

The A300 committee is offering a free (for those who hold a trade show pass for TCI EXPO) A300 Pruning Revision forum at TCI EXPO ’13 in Charlotte, N.C., this November. A300 standards are revised every five years. Come to this forum to learn about the process and proposed topics that will be addressed. There will be a full public review period as part of this process. Learn more about this forum at: www.expo2013.tcia.org.
old. Young trees can withstand a considerably larger dose of pruning than older trees. Up to one half the crown can be removed for structural and specialty training purposes.

- **Types of heading**:
  - Shearing – uniform heading of branch ends, less than 1-year-old wood
  - Tipping – heading branch ends, less than 1-year-old wood
  - Heading back – heading cuts on branch ends, between 1- and 6-year-old wood
  - Topping – heading cuts into wood that is more than 6 years old

And then I have even more advice on illustrations and definitions. Like I said, I’ve given the standards a lot of thought.

**Illustrations**

I think the illustrations in the Pruning standard could be redrawn to better effect. My only concern is that people do what they see and disregard what they read. I know this well as a teacher. The illustrations are accurate, but they tend to show the outer limits of acceptably sized of cuts. Instead I suggest that they should show the average sized cut, with words only used to describe the outer limits, rather than the other way around.

Figure 5.3.2 illustrates a removal cut, but the size of the lateral being removed is two-thirds the diameter of the parent stem. It should be half or preferably less. Figure 5.3.8 shows removing a branch with a narrow angle of attachment. Here, again, the lateral is one-half to two-thirds the size of the parent stem. That would certainly work if it were a young tree, but could be prohibitively damaging if it was a large cut on a mature tree. And Figure 5.3.3 shows a reduction cut taking a lateral off to a stem or branch that is roughly half its diameter. If “smaller cuts are preferred,” it only stands to reason that that is what should be shown. It would be better, I think, to show reduction to a lateral that is two-thirds the size of the parent stem.

**Heading and the terminal role**

Currently the standards define a proper reduction cut by saying that “When pruning to a lateral, the remaining lateral branch should be large enough to assume the terminal role.” (5.3.4)

This is a way of saying that the branch will not die back or watersprout. Although the phrase is cumbersome at first, it concisely and elegantly covers a huge array of circumstances. Trees vary in their ability to withstand reduction pruning, according to their species, age, health and even the climate. So how can one describe this sliding scale of the size of a cut that will be a good cut? A good reduction cut shortens a branch by cutting back to a lateral large enough to assume the terminal role. How else can it be said? I love it!

**Topping**

And finally, I think it is imperative to change the clause on topping.

It is my opinion that the 2008 version of the topping clause has had the unintended consequence of generating the assertion that by heading a branch to an old node (a node not large enough to assume the terminal role), the tree can successfully compartmentalize the decay that follows. This new cut has been variously called a “Shigo cut,” “a selective heading cut” and an “A300 compliant cut.” It is none of those things.

I therefore recommend a return to the 2001 clause on topping.

The 2008 clause reads: “4.51 topping: reduction of tree size using internodal cuts without regard to tree health or structural integrity. Topping is not an acceptable pruning practice.”

The better clause, from the 2001 standards, reads: “4.46 topping: The reduction of a tree’s size using heading cuts that shorten limbs to a predetermined crown limit. Topping is not an acceptable pruning practice.”

**Reasons for pruning**

And finally, the reason for topping or heading should never boil down to, “it’s what the customer wants,” or because “the customer won’t let me take it out,” or “he wants a smaller tree,” or, worst of all, “because if I don’t do it, someone else will.” Just because this is common and customary doesn’t make it right. And getting it right is, after all, why we have standards!

Cass Turnbull is founder of Plant Amnesty in Seattle, Washington.
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– John Russell, managing director, Harley-Davidson Europe, Ltd.

Against the backdrop of a volatile economic landscape, never have the chasms been so wide and the grumbling so loud as the chaos being created in the workplace by our inability to effectively facilitate the differences between the generations. Seasoned leaders complain that Gen Y won’t open emails, only looks at subject lines, won’t pick up the phone, but will answer a text. Younger workers are painted with the brush that they want to be thanked for showing up to work and need a trophy for coming back from lunch.

Missed is that, “They want work that is meaningful and consistent with their socially and environmentally responsible values,” according to Karen Foster in her article “What’s Good About Generation Y?”; qualities that are solidly positive for arboriculture firms. Older workers expect a set of behaviors that we simply have not instilled in our successors nor has the environment they have grown up in rewarded. We interact with them by making them wrong, something which perplexes the younger generation and certainly does not yield the desired response.

According to Jason Ryan Dorsey, the “Gen Y Guy” of The Center for Generational Kinetics, “Gen Y is the only generation in the current workforce that has never expected to work for one company their entire life. In fact, most audiences are shocked when I reveal the actual length of employment that Gen Y thinks equals being a loyal employee… Where companies and organizations struggle is when they solely rely on employment strategies that worked well in the past but are not a fit for Gen Y.” (www.jasondorsey.com)

In the past, we struggled with whether someone offering 50 cents an hour more down the street was going to take our labor pool. Immigration policy continues to remain up in the air as we try to determine whether the economy has recovered or whether we are headed for another downturn. Dr. Martin Regalia, chief economist at the U.S. Chamber of Commerce, shared recently at an industry conference that our recessions usually come in seven year cycles, with the next one being only three years away.

As we continue in uncertain times, we are in economic conditions that neither our education nor our parents’ business experiences prepared us as leaders to handle, now or in the near future. How do we respond to our workforces? We have grown up with train, train, train as the mantra for not only creating safe work environments but also to make sure that the latest techniques and proper use of equipment is well-engrained in our workforce as they head out each day. These certainly remain valid practices, and yet, it’s not enough anymore. This has become the baseline, not the gold standard.

First and foremost, with four generations in play and another coming, we are less alike than ever before in our workforce’s history. This creates communication issues, differing expectations, wasted time from not trying to understand, and frustration that no one needs in the workplace. Secondly, despite The American Dream’s statistics report on www.stageoflife.com that 10,000 people per day are reaching 65, “40 percent of baby boomers plan to work until they drop,” according to a recent AARP survey.” This lack of migration to the next era of life is stunting the professional development of those who would be moving into other phases of their career development in our companies. In addition, it requires those who remain longer than “usual” to adapt, learn new skills and remain flexible to a rapidly changing environment.

On the one hand, we have twenty-some-things trapped in their inability to move into our companies with fewer job openings. They are not learning the skill sets, making their mistakes, and developing experiential wisdom that allows them to step into the roles we all need them to be in...
in their 30s. It’s a lost decade, which is going to show up in another 10 years as we need those very people to step into senior leadership when they hit their mid to late 30s and 40s with the ability to assess risks and make sound judgment calls. How do we prepare our companies for sustainability and look beyond just taking care of the backlog of work we hope we have today? This is a succession planning question that is critical to the future life of our companies and one which we ignore to our peril as business leaders.

Those of us who are in leadership roles use the terms professional development, networking, mentoring, training, and continuing education as if they are interchangeable and return the same result. We need to fine-tune our understandings of what each of these can mean for our employees and become adept at knowing when to deploy what strategy to develop our workforce. We must view our investment of time and dollars in our employees’ careers as part of our sustainability strategy and not a perk. It is absolutely true that our team members benefit from these experiences, and they very well may expect it from the employer. However, we’ve all heard the mantra of “when I stop learning, I’m moving on to the company that continues to teach me something;” – a word to the wise for company owners. It is also absolutely true that when we fail to have a strategy around our workforce development and understand what the various tools are at our disposal, we now risk our company’s very sustainability. The perspective to take is that how well you finesse your understanding of professional development, networking, mentoring, training, continuing education, and now coaching, is a competitive advantage.

What is your strategy for deploying each of these opportunities to develop your very diverse workforce, enhance loyalty, reduce your turnover costs, create a workplace environment that your people want to be a part of every day, and focus your remaining time on growing your business? Each of these ways of maximizing your workforce’s performance has a return on investment for your businesses, and should not be viewed as a cost. The cost occurs when failing to invest.

Professional development is the overarching term that encompasses all of the other strategies that you might deploy. Networking is an experiential learning opportunity that can certainly be a part of your BD (business development?) strategy, but it is also a way for your employees to have a form of “on-the-job” training. Training is providing access to specific techniques that enhance skill and competency required to perform a job adequately. It may include written materials, exams, and on-site skills assessments. Continuing education may include support for certifications and advanced degrees.

Mentoring vs. coaching

Where there is significant confusion is the use of the terms mentoring and coaching. Mentoring is a form of experiential learning, regularly engaged in, between someone in your company who creates a formalized professional relationship with someone who usually has aspirations to more senior job responsibilities than their current employment. Mentoring is characterized by the “off-loading” of information and experiences from one person to another. It may involve exposure to company meetings to which he or she might not ordinarily participate. It may include introductions to key players in the industry and inclusion in golf outings or business lunches. There may be portions of higher level projects or assignments that are entrusted to the mentee to develop his or her understanding with assessment discussions along the way.

When designing a mentoring program, don’t make the mistake of perceiving this as seniority driven and miss the opportunity of “reverse mentoring.” What a tremendous chance for your young leaders to be fully engaged, a key buzzword in HR these days, and to help your long-termers learn relevant new skills by interacting with the younger generations! These types of relationships can have considerable value in the development of an employee; particularly one who has made commitments to the company with regard to their long-term intentions; not to mention fostering understanding between generations. In addition, the creation of a culture that values all voices at the table based on the contributions they can make creates a cutting-edge brand reputation for you.

Coaching, on the other hand, is not men-
Coaching is a process that usually involves hiring a third party from outside the company as an executive or professional coach to an individual or a team of individuals. It is important when seeking a coach to identify someone who has received appropriate instruction and certifications. The most important aspect of coaching is that it is confidential. If there is not an expectation of confidentiality, this must be disclosed by the employer to the coachee(s) at the onset of the relationship.

The primary characteristic of coaching is the use of questioning as the methodology by which the coachee explores topics of professional development, behavioral responses, and personal/professional growth that allows them to become more effective in their work environments. Certainly, there are assessment tools that can be used throughout the process, goals and homework for the coachee to work through, and ongoing discussions of progress. However, to reemphasize, coaching is not mentoring. Coaching involves 80 percent listening and 20 percent determining the appropriate questions and paths to guide the coachee in their self-exploration.

The ultimate goal is to alter behaviors that are preventing the maximum performance of the individual and/or the team, all of which impact the bottom line. One of the key aspects of coaching is having someone hold the coachee accountable. When goals and commitments are outlined between sessions and are not kept, that alone is a behavior that must be examined and addressed. Again, coaching relationships do not involve reporting back to the supervisor, company owner, or peers; nor is session content part of the performance evaluation process.

Coaching can also be a skill set that is taught to the leaders of a company in order to facilitate change management, reinforce culture and to assist their key players in adapting to new behaviors in order to be successful. Creating a coaching environment requires an “all-in” approach. It necessitates support from the top for the financial and time resources required and a belief that people are how the bottom line will be improved. We are moving faster than ever before with technology in the field that allows us, and demands of us, communication and response to our peers, supervisors, and customers that we would not have dreamt of even 10 years ago. Who had an iPad in the field four years ago? They didn’t EXIST! And now, you tell me that I have to take the time to engage coaches for my people? Everyone is looking for the competitive edge and once everyone adapts to the latest technological change or innovation, there is no longer an edge. Our edge always comes from people who improve strategy, problem solve, and increase productivity and, therefore, the bottom line.

Whether hiring certified coaches as leadership partners or creating a coaching environment in your company, coaching investments in our employees are the sustainability strategy and competitive advantage of the 21st century.

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Cynthia Mills, a former president and CEO of TCIA and founder of The Leaders’ Haven, is a CEO, executive and professional coach, consultant, board facilitator, speaker, author, teacher, and practitioner, working nationally and internationally. This article is based on the presentation she will make on the same subject at TCI EXPO 2013 this November in Charlotte, North Carolina. For a complete EXPO schedule or to register, visit www.expo.tcia.org or call 1-800-733-2622.
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Man rescued from tree

Xcel Energy crews working with emergency responders in Hereford, Texas, rescued an Amarillo man who was stuck in a tree August 1, 2013. Firefighters, police and paramedics responded but were unable to position a ground ladder to get to the man, who was suspended about 25 feet in the air by a safety rope. Nearby Xcel workers were called in and used their double-bucket lift to extract the man, who was gripping a limb mostly upside down with the rope tied around his lower legs and feet. One worker grabbed the man, while another cut the safety rope. The trimmer was then brought into the bucket and lowered to the ground, according to an Amarillo Globe-News report.

Trimmer cut with chain saw

A tree care worker was injured August 2, 2013, while working on a state contract clearing trees near I-395 northbound in Waterford, Connecticut. The highway was shut down while a helicopter landed to pick up the injured man. The victim was using a chain saw at the time and may have suffered a neck injury, according to a connecticut.cbslocal.com report.

Pregnant woman killed by falling tree in NYC park

A pregnant woman sitting on a park bench in Kissena Park in Queens, New York City, was struck and killed by a falling tree August 4, 2013, and another woman hit by the tree was seriously injured.

Paramedics tried to resuscitate Yingyi Li, 30, for several minutes, but she was pronounced dead after being taken to New York Hospital Queens. The other woman injured by the tree was in serious condition.

Some residents said they hoped the tragedy would push the city to spend more money on park maintenance, according to a www.nbcnewyork.com report.

Tree worker rescued after pinned

A tree cutter was rescued August 6, 2013, in Old Bridge, New Jersey, after he had gotten pinned by a falling limb 40 feet off the ground.

Trapped in the branches, the victim was stuck for about half an hour before a fellow worker in a bucket lift used a chain saw to cut the worker free.

The victim had not placed the rigging line properly on the limb, according to the owner of the tree care company. The victim suffered cuts to his hand, according to the CBS New York report.

One man killed, second hurt by car

One man was killed and a second injured August 7, 2013, when they were hit by a car while clearing storm debris from a road in Appleton, Wisconsin.

Eugene LaCombe, 67, of Appleton, was cutting a tree to remove it from the road with Keith Franks, 23, at about 1:40 a.m. LaCombe’s vehicle was parked in the northbound lane with its headlights and flashers on. They were in the southbound lane when they were struck by a vehicle operated by a 19-year-old from Porterfield, Wis.

LaCombe died at a local hospital, but Franks was expected to survive.

Heavy rain, wind and the glare of headlights from LaCombe’s vehicle contributed to the driver not seeing the men, according to a WISC-TV/Channel3000.com report.

Climber electrocuted performing line clearance

A tree worker died August 07, 2013, when he made contact with a power line while trimming a tree in Traverse City, Michigan.

The man, believed to be a Traverse City-area resident, was one of two tree care company employees working behind a residence doing utility line clearance. The victim had accessed the tree and tied himself off when he made contact with a primary high-voltage line. He was pronounced dead at the scene, according to The Grand Rapids Press report.

Man killed cutting trees at church

A man who was volunteering to cut trees August 10, 2013, at his church in Columbus, Georgia, died after a tree limb fell on him.

One of the limbs fell and struck Glenn Nunley, 51, of Midland, Ga., in the head. He was taken to the hospital and died the
next morning, according to a WRBL News 3 report.

**Man hurt in fall from tree**

A man was injured after slipping and falling 20 to 25 feet out of a tree August 11, 2013, in Kinmundy, Illinois.

Walter West, Jr. had been cutting limbs out of a large tree at his mother’s home when he slipped and fell when coming down for lunch. West landed on his back and left side on top of the large limbs he had cut out of the tree.

Kinmundy-Alma ambulance personnel took West to Salem Township Hospital where he was immediately loaded into a medical helicopter and taken to a St. Louis hospital for treatment, according to a WJBD Radio report.

**Landscaper cuts leg with chain saw**

A landscaper trying to saw through a small tree August 13, 2013, in West Newbury, Massachusetts, was taken to Anna Jaques Hospital in Newburyport after slicing open his leg with a chain saw. The blade tore through tree service employee’s upper right leg near his thigh, causing a substantial laceration.

By the time a police officer responded to the scene, the wound had all but stopped bleeding, thanks to quick-thinking people at the scene. While the officer described the wound as a “good gash,” those at the scene had applied pressure long enough to prevent life-threatening bleeding. The victim was treated for a serious but non-life threatening wound and transported via ambulance to Anna Jaques.

The victim is a longtime employee of the local tree company with plenty of tree removing experience, according to the Newburyport Daily News report.

**Teen worker dies in fall**

A teenager died August 13, 2013, after falling 50-feet from a tree in Clay County, Florida. Blake Bryant, 14, of Palatka fell after he accidentally cut through his safety harness while working for a tree service in Middleburg, Fla.

Bryant climbed a tree and was cutting off a section when the accident occurred. He was flown by helicopter to Shands Jacksonville where he was pronounced dead. Internal injuries caused by the fall proved to be fatal.

The teen was assisting on the project, but does not normally work for the company, according to a First Coast News-WTLV/WJXX report.

**Tree worker injured in struck-by**

A 29-year-old tree worker was in critical condition after a tree branch fell on him August 14, 2013, in Atlanta, Georgia. The man was working with a tree service company trimming trees when he was hit in the back of the head by a 3-foot-long, 8- to 10-inch diameter branch.

The man, who received a severe gash in the back of his head, was unconscious when emergency crews arrived. He was airlifted to Atlanta Medical Center, according to a WSB-AM radio report.

**Tree worker rescued after fall**

Firefighters assisted with the technical rescue of a tree worker who fell from his aerial lift bucket August 14, 2013, in Longmeadow, Massachusetts.
The worker was clearing branches from electrical lines, and somehow slipped, but was apparently saved by his safety line. He was dangling from the basket by that line for a time, but was not seriously hurt, according to the WWLP News 22 report.

**Man hurt in fall from tree, wife injured**

A man cutting tree branches suffered back and arm injuries after a 20-foot fall from a ladder August 14, 2013, in Wayland, Massachusetts. His wife was also injured when she tried to break his fall.

The 52-year-old man was complaining of back pain and had either a broken or dislocated right arm after the fall. The man did not lose consciousness, but showed signs of extremity fractures and possibly a chest injury. He was flown to a Boston hospital by a medical rescue helicopter.

The man’s wife was taken to Newton-Wellesley Hospital for treatment of an elbow and arm injury, according to a report in The MetroWest Daily News.

**Operator injured when bucket breaks loose**

A tree service employee was hospitalized after the bucket lift he was in broke from its boom and fell to the ground August 15, 2013, in Hillsdale, Michigan. The man, 41, was in critical condition a day later at the University of Toledo Medical Center in Ohio.

Workers for a Henrietta Township tree company had begun taking down a tree and the man was about 60 feet in the air when the area connecting the bucket to the boom broke. This caused most of the fiber-glass bucket and the man to fall. The boom appeared to be fully extended and workers told authorities it had a 65-foot range, according to The Jackson Citizen Patriot report.

**Homeowner injured in fall from ladder**

A man was injured August 17, 2013, after falling off of a ladder in Bullville, New York. The man, who was atop a ladder cutting a tree at his home, was hit by a cut limb and fell off the ladder. He was taken by helicopter to Westchester Medical Center for treatment, according to a Times Herald-Record report.

**Man killed by cut tree**

A man was killed August 18, 2013, in Crawford County, Pennsylvania, after being struck by a tree. The accident happened in a wooded area in Mill Village, Pa.

Douglas Brown, 50, was cutting trees with his father when a tree fell, hitting Brown on the head. Brown was pronounced dead at the scene, according to a WJET-TV report.

**Father dies cutting trees with sons**

A man died August 18, 2013, in Oro-Medonte Township, Ontario, Canada, while cutting down trees for firewood.

The man, 49, and his two sons were cut-
ting down dead trees in a wooded area adjacent to their property for winter firewood. They were working on the removal of a dead beech tree that suffered damage from an earlier break in its trunk. When the tree was cut, it shifted and fell toward the father, who was pinned beneath the tree. The sons had to cut the tree to get it off their father, according to a report in *The Packet & Times*.

*Sent in by TCIA member Devon Hutton, owner of SugarBush Tree Service in Coldwater, Ontario.*

**Landscape worker electrocuted**

A landscape worker died August 20, 2013, in Holliston, Massachusetts, after he hit a power line with a saw while cutting down tree branches and was engulfed in flames. Ryan Patrick Hopkins, 26, was airlifted by medical helicopter to Massachusetts General Hospital in Boston with his body covered in serious burns. He died at the hospital a short time later.

Police and fire officials found the man engulfed in flames while in a boom-hoist apparatus attached to a bucket truck. Firefighters could not immediately move the bucket because it was possibly electrified, so another worker used a truck to push the bucket away from the wire.

Two co-workers were below the truck when the man was shocked, but were not injured.

Hopkins was working for a Holliston landscape company at the time of the incident, and had been an employee for 10 years, according a report in *The Sun Chronicle*.

A report to TCIA indicated Hopkins was working in an un-insulated lift when he made contact with primaries.

**Tree trimmers shot in rampage**

An elderly Craven County, North Carolina, man was charged with shooting and injuring several people, including two tree trimmers, August 20, 2013, in Vanceboro, N.C. John Jenkins, 82, a Korean War vet, was charged with assault with a deadly weapon with intent to kill.

Jenkins was apparently irate at the tree trimmers, possibly for leaving cut limbs on his property, and wounded three people before an officer returned fire and injured him.

Two tree trimmers, Angelo Williams and Brian Holden, were wounded first by a shotgun. Williams was struck in the face, while Holden was hit by pellets in his mid-torso.

Authorities say Jenkins then went down the road and fired at two other workers who were in bucket trucks. They were not hit. A few minutes later Billy Dail, who lives nearby, was shot. Dail was wounded as he was trying to direct traffic away from the active shooting scene. He was hit on the left side of the face, head and hand.

Jenkins was hit in the face and head when he was shot by a Vanceboro Police Department officer and was listed in critical condition. Jenkins suffers from dementia and old age and the police had dealt with him in the past. He may suffer from post traumatic stress disorder, according to a WITN News report.

**Trimmer dies under palm fronds**

A tree trimmer died August 21, 2013, after getting caught underneath heavy fronds on a palm in Mesa, Arizona. The man was unresponsive when firefighters arrived after being called to a home where a trimming crew was working in the backyard.

The trimmer had used a belt and spikes to climb the tree and was about 35 feet up in the tree when he got caught by the weight of the fronds. Firefighters used a ladder truck to reach the body, according to a www.claimsjournal.com report.

**Tree worker hurt in fall**

A tree worker was hurt after falling from a tree August 26, 2013, in East Knoxville, Tennessee. The man fell 40 to 50 feet from a tree, hitting a large limb on the way down. The victim was working for an independent contractor. The victim’s condition was not immediately available, according to a WATE ABC Channel 6 report.

**Trimmer dies from possible electrocution**

A tree trimmer died Aug 31, 2013, after possibly being electrocuted on the job in Miramar, Florida.

Livabon Gerimere, 55, was pruning a tree at a home. When officials arrived on scene, they found Gerimere unresponsive and it appeared that he had been electrocuted. Rescue crews were unable to gain immediate access to him for fear that some wires were still live, so they had to wait for almost two hours for Florida Power & Light crews to arrive on scene before reaching Gerimere, who was pronounced dead on the scene, according to an NBC 6 South Florida report.
New pesticide labels aim to protect bees, other pollinators

In an ongoing effort to protect bees and other pollinators, the U.S. Environmental Protection Agency (EPA) has developed new pesticide labels that prohibit use of some neonicotinoid pesticide products where bees are present.

“Multiple factors play a role in bee colony declines, including pesticides. The Environmental Protection Agency is taking action to protect bees from pesticide exposure and these label changes will further our efforts,” said Jim Jones, assistant administrator for the Office of Chemical Safety and Pollution Prevention, in August.

The new labels will have a bee advisory box and icon with information on routes of exposure and spray drift precautions. This change affects products containing the neonicotinoids imidacloprid, dinotefuran, clothianidin and thiamethoxam. The EPA will work with pesticide manufacturers to change labels so that they will meet the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) safety standard.

In May, the U.S. Department of Agriculture (USDA) and EPA released a comprehensive scientific report on honey bee health, showing scientific consensus that there are a complex set of stressors associated with honey bee declines, including loss of habitat, parasites and disease, genetics, poor nutrition and pesticide exposure.

The agency continues to work with beekeepers, growers, pesticide applicators, pesticide and seed companies, and federal and state agencies to reduce pesticide drift.

(Continued on page 65)
dust and advance best management practices. The EPA recently released new enforcement guidance to federal, state and tribal enforcement officials to enhance investigations of beekill incidents.

More on the EPA’s label changes and pollinator protection efforts: www.epa.gov/oppp00001/ecosystem/pollinator/index.html

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