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The Winter of Our Discontent

Each year as I get older and the winter seems to get longer, I understand more and more the urge of migrating animals to take flight south. This winter has been particularly “discontenting” … with long stretches of frigid weather, blizzards in regions where there shouldn’t be snow, and more flight cancellations in January than during any previous month on record. When it is warmer at the Winter Olympics than it is in Florida, you have to wonder if the entire world has been turned upside down.

In a good winter, a nasty storm or two can be a boon to commercial and utility tree care companies. A storm that causes moderate damage can provide a couple of weeks of work during a slow time of the season. This winter, most members I’ve talked to report the opposite result: either the storms disrupted normal business and really didn’t do enough damage to provide that extra work, or it has simply been too cold to send crews and equipment out at all. Members in the upper Midwest report almost four full weeks of lost production revenue after long stretches of single-digit or below-zero temperatures.

There are positives to a winter with too much ice, snow and cold weather of course. Companies that plow during the season are having a great year. All this downtime is an opportunity to hold in-house training, which will pay off in a more skilled and safer workforce when the snow finally melts. And the urge to flee the cold resulted in the best attended TCIA Winter Management Conference in our history.

Much like the seasons of the year, businesses like commercial tree care have cycles of up and down. While many of those cycles are seasonally related, there will be challenges and successes that all businesses experience that have nothing to do with the weather. Business owners face recessions, employee injuries, lawsuits, equipment failures, new competitors and employee turnover – no matter the weather. Each spring, those companies that followed best tree care and business practices will emerge from even the worst winters better able to compete for another year.

As we turn the calendar toward spring, conditions are starting to improve – even though March is usually the snowiest month in New England. The days are noticeably longer, pitchers and catchers have reported for spring training, and cash is starting to flow from customers renewing their plant health care programs for another year. At TCIA, we weathered the winter well. We stand ready to assist our members in advancing their businesses for another year. If you need some help or have a question you’re having trouble finding an answer for, give us a call. We’re here … watching the snow fall outside yet again.

Mark Garvin
Publisher

TCI’s mission is to engage and enlighten readers with the latest industry news and information on regulations, standards, practices, safety, innovations, products and equipment. We strive to serve as the definitive resource for commercial, residential, municipal and utility arborists, as well as for others involved in the care and maintenance of trees. The official publication of the non-profit Tree Care Industry Association, we vow to sustain the same uncompromising standards of excellence as our members in the field, who adhere to the highest professional practices worldwide.
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ON THE COVER: Mark Malmstrom, owner of Total Tree Care, Inc., in Logan, Utah, is about the cut this cottonwood “stick” into manageable lengths. See story and more pics of the takedown, page 50.

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What kind of skid-steer or compact-loader user are you? The kind who takes great care of the equipment, able to get right to the job? Or one of those who treats machines like disposable tools, running them until they need to make repairs (and they always seem to be making repairs)?

The former is confident he’ll be making money by spending it; the latter thinks he is saving by not spending.

Jamie Wright, product manager for Terex Construction Americas, puts it succinctly. “Owners and operators need to see the value of a daily maintenance program or they won’t do it. Machines need daily attention so they continue to perform in the field. If the machine isn’t regularly cleaned, lubricated and serviced, it will slow down or freeze up, causing more downtime to fix than it would have taken to handle the little daily tasks.”

“Compact loaders should be thoroughly inspected before putting the machine into initial operation,” Wright suggests. “After this inspection, a regular maintenance schedule for compact loaders includes daily (every 10 operating hours), weekly (every 50 operating hours), six-month (every 500 operating hours) and annual (every 1,000 operating hours) inspections and service.

“The first task for any preventive maintenance program isn’t even performed on the machine,” he says. “Develop an inspection plan based on the manufacturer’s recommended guidelines, one that incorporates a timeline and assignments for specific tasks. The inspection plan starts as a simple checklist, becoming a habit operators automatically do at the start and end of each day.”

“Daily maintenance should be simple and easy to follow,” Wright says, “yet provide attention to detail. The best person for daily maintenance is the operator – the one who knows the most about the machine’s particular sounds and performance. Before the workday begins, it is important to check the main fluid levels, including the hydraulic oil, engine oil, fuel and windshield wiper fluid, and to refill if necessary.”

“Walk around the machine, checking for damage from the previous day.” Wright says, “A visual inspection should also include checking for leaks and making sure all the machine’s systems are lubricated and functioning properly. Operators need to pay close attention to details during the morning walk-around, logging completed action items and noting anything that does not pass inspection. If anything needs to be repaired or replaced, do it immediately and report back to the person responsible for the equipment fleet.”

“At the end of each day, while a compact loader is still warm, wash down the unit – removing any dirt, dust, sand or other job-site material that can accumulate and contaminate your machine – and lubricate the unit according to the manufacturer’s lubrication plan to ensure that the lubricant reaches all the critical points. During this process is a great time to do another visual

By Rick Howland
check for any external or internal damage, repairing and replacing parts as necessary, and then to report anything that happened with the machine.”

“Keep a daily log,” Wright emphasizes, adding, “It is essential, also, at the end of the day that operators not only report the hours on the unit but also how it is being used. For example, is it driving hard into piles? What kind of materials is it handling? How far are the materials being transported?”

“At every 50-hour mark, a compact loader should go through a more extensive inspection,” he maintains. “Weekly inspection includes checking the condition of the tires, tire pressure and tightness of the wheel nuts; the axles and undercarriages; the bearing bushings and the pins/bolts; the steering assembly; the brake functions; and the function of all the safety devices.”

“Also, because dust can cause significant machine damage, the dust filter should be cleaned each week. During this check up, the operator should drain the fuel filter and properly lubricate the machine, according to the manufacturer’s guidelines. Weekly inspections are also a good time to review manufacturer service bulletins and make updates as recommended,” he adds.

Wright notes that “Around every 100-hour mark, inspections need to include additional tasks, such as draining water from the fuel tank and bleeding brakes. Check machine components, including the air intake, the V-belt tension, the engine mount and pump attachment and the engine speed settings. It is also a good idea to check the upper and lower idle speeds, the acid level and battery connections as well as the machine’s hydraulic functions. The insert of the hydraulic oil return suction filter also needs to be replaced at this point.”

“Once a compact loader hits the six-month mark, the engine oil and filter, and the fuel filter, need to be changed,” says Wright. “Normal daily and weekly checks should be done with extra attention. The six-month check is a good time for the operator and the service technician to have an open discussion about how the machine is being used day in and day out, as well as how it’s performing. Also, it is a good time to look at the maintenance records to spot any patterns – it is important to look at what components are failing and to determine why, how and when they failed. It is also important to know which components are holding up over time, and to analyze those trends. Too often, the little things can be an indication of larger problems. Owners, operators and service technicians should never ignore these warning signs.”

Annually, he says a compact loader should get a complete once-over. “This is a good time to replace the cab ventilation’s dust filter, to change hydraulic oil, replace the breather and the brakes, as well as change the oil in the wheel hubs and axle differentials.”

Finally, he concludes, “Everyone in contact with the loader is accountable for the success of its preventive maintenance program. Field supervisors need to make sure that the operators are doing the daily tasks. Fleet managers need to confirm with the field supervisors and operators that the machines are being maintained each day, as well as what repairs have been done or are needed. All of this information should go on file with your company as well as with your equipment dealer.”

Morbark’s Jason Showers says manufacturers are simplifying maintenance. “The Boxer is very mechanical, not overly auto-
mated with electronics. There are some, but minimal."

"With maintenance, there are four basic systems to be concerned with – fuel, hydraulics, air filtration, and engine oil," he says. "We recommend when you first get a new machine to change the break-in oil at about 20 to 50 hours, plus the hydraulic filter. After that, depending on use, most guys can do yearly maintenance; which is to change the engine oil and filter, hydraulic oil and filter, inner and outer air filters and fuel filter. The worst case is twice a year with very heavy use. If you use the machine year-round, think about spring and fall. Filter kits are only $150."

"You should change hydraulic oil every other year, depending on use," Showers says, "keeping in mind that hydraulic oil heats up and loses viscosity and detergent qualities. The loader is really a rolling hydraulic pump powering what (attachment) you have on the other end."

"Annually, maintenance of a compact loader would be $200 to $225 if you do everything yourself," Showers states. "If you don’t maintain your loader, and that includes clean hydraulic connections and oil, you’re whistling away at the useful life and creating a higher possibility for catastrophic failure at an early age, possibly halving its 10-year lifespan, or worse," explains Showers. "These engines are not rebuild-able following a catastrophic failure, and for replacement of a typical 32-horsepower base engine, you’d be looking at $6,000."

Showers says, "If you do the math, since these compact loader machines cost $20,000 to $30,000, your return on maintenance can be better than 2- to 1 if you simply do the maintenance. Not only do you avoid costly premature capital wear, you also are looking at better resale or trade-in value and, of course, reduced lost time due to maintenance issues."

Andy Van Soelen is rental and tree care equipment specialist for Vermeer, which makes three models of the TX compact loader. He says, "Vermeer does what we call preventive maintenance plus," explaining that there are things we recommend one can do, such as replacing the fan belt at 500 hours, not when it breaks."

"Daily, we recommend you check all grease points, especially on the loader arms, and check fuel. We recommend filling the fuel tank at the end of every day." He explains that this simple step "limits condensation in the tank, which usually occurs overnight when temperatures drop. The same goes for grease at the end of the day. This helps protect metal seals from corrosion caused by condensation. At the beginning of the day, check all fluids."

"Our air cleaners have indicators showing in red when it’s time to change them. We do not recommend that owners and operators wash cleaners or even take them out until they need to be replaced. Removal and especially washing will compromise the integrity of the air filter," he explains.

Additionally, Van Soelen says, "You’ll want to check all tracks on tracked machines to see that they are properly tensioned. An easy way to check is to put a foot on the track. More than an inch of ‘give’ means the track needs to be re-tensioned. Otherwise there is a possibility for tracks to fall off the sprocket."

He illustrates the cost benefit of simple track maintenance. "Replacing the track is a two-person job requiring a couple of hours of labor, whereas taking off the cover and proper tensioning takes five minutes." He adds that in addition to stopping a machine dead in its own tracks should a track come off its rollers, mud or debris can also cause premature wear. "The cost is at least $500 for rollers, excluding labor," he warns, adding that washing the machine to remove debris helps components last longer.

"Regarding the universal (attachment) mounting plate, grease the pivot pins daily or every 10 hours," says Van Soelen. "Give the plate a once-over look, checking for cracks and to ensure that the hydraulic connectors from the attachment going into the hydraulics are clean. Common sense also dictates checking attachments to see that nothing is broken or cracked. If a log grappling has a crack and you don’t see it, a log can fall on the machine."

New from All Access Equipment is the Forway compact articulated loader, offered in two models, the WL25 and WL35. As far as maintenance is concerned on these units, "A grease gun and oil changes are about it," says Leonard Polonski, with sales and marketing for All Access.

"Because this is a less complicated machine, maintenance is substantially reduced," says Polonski. "For example, the WL25 and WL35 do not have chain drives, and feature long-lasting tires."

"But for areas that do need regular care, another feature, the easy-access and easy-to-tip cab assembly, in turn, provide for
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quick access to the engine and transmission for routine checks and maintenance,” he says. “Simplification of design and maintenance are all intended to promote regular maintenance.”

Polonski suggests five easy, routine daily maintenance checks. To ensure you check them all, Polonski says to perform them alphabetically:

- **E** – engine. Check the oil level daily, and change filters according to the machine’s maintenance schedule.
- **G** – grease. Inspect pivot/lift points and grease daily.
- **H** – hydraulic fluid. Check fluid level daily through the machine’s sight window, and change according to machine specs. (This is critical since the hydraulic fluid powers not only the hydraulic drives but also the hydrostatic transmission.)
- **R** – radiator. Check coolant level daily and check for discoloration, which can indicate contamination or coolant’s end of life. Flush and refill according to machine specs.
- **W** – windshield. The WL35 features a windshield wiper and washer. Check the blade and fluid reservoir daily.

Mike Fitzgerald, loader product specialist for Bobcat Company, asks the big question: “Do you want to be proactive and productive or reactive and minus a resource?”

“If you’ve had a machine breakdown or lost valuable work time that could’ve been avoided by following your manufacturer’s recommended maintenance schedule, you know there’s a big difference,” he says. “You can minimize many issues with good, scheduled maintenance.”

“Your ability to protect your assets and prolong their useful life,” he says, “is largely dependent on your commitment to develop a consistent maintenance plan that covers three key areas: properly analyzing business needs with machine capabilities, following recommended intervals and anticipating wear, and expanding one’s knowledge about today’s maintenance trends. Owners and operators who focus on these things will have the best chance of maintaining a healthy fleet.”

“Industry experts agree that the first step toward developing a proactive approach to maintenance is analyzing how you will use a compact excavator or a loader and assessing specific capacity ranges. If your equipment is allocated to jobs it’s not designed to handle, you are more likely to be faced with an underperforming machine that may need frequent repairs.

He says, “You need to get familiar with the maintenance portions of your machine’s operation and maintenance manual. Routine daily service intervals for fluids, lubricants and filters should be followed diligently during normal working conditions, and as temperatures drop, machine service requirements can change. In cold weather, items that should be adjusted and monitored to meet winter weather include fuel, tire pressure, block heaters, battery and cold-climate comfort features such as heating and defrosting systems. Equally important is an engine oil viscosity that matches the outside operating temperatures and a low-temperature grease for proper lubrication on pivot points. Hydraulic oil filters should be changed as they may have collected water and debris over the warm months.”

“As you accumulate hours on any compact equipment, you’re going to wear out tires, tracks, cutting edges and pins,” Fitzgerald says. “It’s not a question of whether those items will wear, but rather when it’s going to happen.”

“Tires on skid-steer loaders will usually last around 600 to 800 hours if working on dirt most of the time at proper inflation levels. Tire life may be reduced if operating on improved surfaces frequently. Compact track loaders have rubber tracks that wear and need to be maintained. Some owner-operators can reach 1,200 to 1,600 hours on loader tracks if they’re operated properly, kept clean and tensioned when required.”

One cardinal rule of maintenance reflected by virtually everyone interviewed for this article is: always follow manufacturer-recommended guidelines. And a truism alluded to by all regarding loader and skid steer maintenance is, pay a little now or pay more later.
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Chain saws are important, everyday tools for arborists, used for any number of felling, pruning or crane jobs — and sometimes it can be easy to forget a few simple safety measures that can lead to injury or tragedy.

By Keith Norton

Consider the chain saw. It’s an instrumental tool in the arborist’s arsenal, an essential part of the job we do each day. Like all technology, the chain saw has undergone many improvements since its introduction to the mainstream — once a 50-plus-pound monstrosity, today’s chain saws are lightweight and have numerous safety features.

But that doesn’t mean that essential and basic safety tips should be ignored, forgotten or otherwise marginalized. Enhanced safety features on today’s chain saws only work when they are properly utilized by tree workers.

Across all arborists’ work, from pruning to felling to crane removal, safety is vital. So here are some considerations that you may not be thinking about each day.

Understanding kickback

Chain saw kickback is a familiar safety concern — an arborist is working with a chain saw, and suddenly the saw jumps backward, quickly and with force. But what causes this to happen?

Kickback occurs when something comes in contact with the upper quadrant of the bar tip, or if an arborist attempts to cut a piece of wood with this upper quadrant. When the chain rotates over the upper quadrant, the leading edge of the cutter tooth becomes higher than the raker — the tooth now bites into the wood and stalls the chain.

Because of the high RPM and torque involved in powering the chain saw, this sudden stalling of the chain causes the chain saw to kick backwards. The speed at which this happens is approximately seven times faster than human reaction, and the results can be catastrophic. So how does an arborist minimize or otherwise mitigate kickback?

First and foremost, always know the location of the tip of your bar. Modern chain saws are equipped with a chain brake, a safety device that stops the chain from moving when kickback occurs. This device won’t stop the propulsion of the device, but the damage caused by a moving chain during a kickback event will be far greater than if the chain is stopped.

For this reason, the chain brake is an essential feature on a chain saw. But I’ve seen arborists in the field remove the chain brake from their equipment. This is nothing more than a recipe for disaster; a chain brake should never, ever be removed from a chain saw. If your chain brake becomes damaged or broken, take the saw out of service.

Additional safety devices

A number of other safety devices are inherent to modern chain saws, and many in the industry simply don’t realize their function. For instance, the chain catch, which is located underneath the saw, is another device that helps stop the chain from rotating as it flies back toward the operator if the chain is derailed. The chain catch is usually made of soft metal or plastic, so when the chain comes off, it digs into the chain catch and helps stop the chain from turning. Broken or missing chain catches are the leading reason our safety auditors red flag chain saws during safety audits on tree crews.
The rear-handle guard, commonly referred to as the toe or heel plate, protects the operator’s hand on the rear handle. A trigger interlock prevents the trigger from being accidentally activated by a foreign object. If the trigger interlock is not depressed, the trigger can’t be squeezed.

Unlike those old saws from the 1950s, today’s saws are equipped with vibration control systems, which can make for easier handling of the saw and can help prevent hand-arm vibration syndrome (HAVS), a potentially devastating condition that affects laborers who consistently and continually handle vibrating machinery.

Spark arrestors are another feature found on chain saws. Spark arrestors can reduce spark generation that can lead to combustion. Some arborists may remove spark arrestors from chain saws, as they believe the device restricts power, but this is a potentially dangerous mistake. In certain environments, operating a chain saw without a spark arrestor can lead to a major fine. It is against ANSI standards (specifically, ANSI Z133-2012 6.3.1) that any safety devices be removed or modified on chain saws.

**Proper operation and handling**

Another consideration when mitigating kickback and other safety concerns is the position of the body relative to the chain saw. This should be carefully considered when making cuts, and several ANSI standards apply specifically to the handling of chain saws.

A stable body position is required while starting the chain saw. The Z133-2012 Section 6.3.4 states, “Drop starting a chain saw is prohibited. A chain saw shall be started with the chain brake engaged and the operator holding the saw firmly in a manner that minimizes movement of the saw when pulling the starter handle.”

That’s not without a reason. Drop starting was impossible once upon a time, as the machines were physically too heavy to execute this method. As two-stroke technology improved in the 1960s, and saws became lighter and lighter into the 1970s, drop starting became prominent, and was taught to many arborists as they came up in the industry. I was taught to drop start in my early days; it can be a difficult habit to break.

Not only is this method dangerous, as the chain saw is unsecured and in motion as it is started, but think about how many times you start your saw in a day. How many times in a week? In a month? In a year? In a decade (or multiple decades, for some of us)? Drop starting can lead to a repetitive motion injury. Rotator cuff surgery is by no means an uncommon requirement for arborists at some point in their careers, and the drop start method doesn’t help this statistic.

Proper handling and grip of the chain saw is also essential to minimize kickback and other safety concerns as well. It’s not uncommon see an arborist grip the chain saw by positioning their thumb on top of the handle, rather than around the handle. This improper grip increases the risk of...
Bandit Industries backs away from Alamo offer

Bandit Industries will remain privately owned, in the hands of current owners Jerry Morey, Mike Morey Sr. and Dianne Morey. The three have elected to turn down the offer from Alamo Group Inc., negating Alamo’s pending acquisition of Bandit.

“Alamo is an exceptional company and we are very honored that they’ve shown such an interest in Bandit and our corporate culture,” says Jerry Morey, Bandit Industries president. “We share many common ideas and visions, and we are grateful for the relationships we’ve built. Ultimately, we decided the best future for Bandit and our 400 employees at this time was to remain a private company.”

Last year, 2013, was a record sales year for Bandit, and the company recently completed a factory expansion of approximately 20,000 square feet, with additional expansions in the works.

“When we first announced that we were considering offers to sell Bandit, (we) said that we would only sell if it was the right fit,” said Morey. “Taking care of our employees and our dealer network, continuing to support our mid-Michigan community and maintaining the Bandit legacy we built over the last 30 years; these are things we cannot put a price on. Bandit Industries is stronger than ever because of our employees, the hard work from our dealers, and our basic business model of building reliable equipment and taking care of our customers. We will continue to explore options for a potential sale of the company while sticking to these basic truths that form the core of Bandit Industries.”

Bandit employs 408 people at its mid-Michigan headquarters. Its global dealer network has more than 160 locations.

Chain saw fundamentals

(Continued from page 15)

injury in the event of kickback; Z133-2012 6.3.6 specifies that operators grip the chain saw handle with the left hand and thumb gripped firmly around the forward handle, and the right hand and thumb gripped firmly around the rear handle, unless certain situations render this method more dangerous, as determined by an employer.

Chain saws and cranes

Utilizing a crane is often necessary for large-scale jobs or trees that may be positioned over delicate property that must go undamaged (often a structure, such as a house, garage or shed). With the use of cranes, several new considerations crop up.

Since this type of work involves climbing the tree, working from an aerial lift or being otherwise hoisted to considerable heights for the arborist, concerns over chain saw positioning are vital. Arborists must consider the location of their climbing line and safety lanyard relative to where they will be cutting.

Making cuts is a different experience while in a tree or suspended from crane, as well. It can be advantageous to utilize a handsaw to finish certain cuts. Additionally, snap cuts are a popular method, where a climber will make a cut almost completely through the trunk or limb, then will cut from the opposite side an inch or two below the first cut, bypassing it. The climber will then move out of the way, allowing the crane operator to snap the wood off.

Cutting in from one side and then working the saw around in a rotating manner is another technique, but this can sometimes result in the saw getting pinched in the cut. Some prefer to make a small notch and then cut through from the back. This will allow the crane operator to slightly move the load if it pinches the saw. Small wedges are also handy to have to help prevent the cut from pinching the saw.

It is important that the arborist estimate the weight of the tree section that will be cut prior to making the cut, as per Z133 5.7.9. Using multiple chokers and balancers can help make a balanced pick. The goal is to not have the pick swing or roll. The estimated load weight must be communicated to the crane operator, and after the pick is complete, the crane operator should verify, compare and communicate that weight back to the arborist. A green log weight chart must be available to the crew. You can use the calculator on your cell phone in combination with the log weight chart to make quick calculations, as well.

The technology available to today’s arborists means that the job is much safer than it has been in the past. But brushing up on fundamental chain saw techniques and safety practices is never a bad idea – and if you’re not following them, there’s never a better time to start than right now.

Keith Norton is training manager with ACRT Urban Forestry Training, a division of ACRT, Inc., an employee-owned utility vegetation management consulting firm, and a 29-year TCIA member, headquartered in Akron, Ohio. He is also a voting member of the Z133 committee and a member of subcommittees examining electrical hazard and cranes.
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Rayco T260 stump cutter

Rayco’s new T260 self-propelled stump cutter is designed as a compact powerhouse for high-production stump removal. Easy to transport from one job to the next, the T260 weighs just 22,500 pounds and has an overall width of 93 inches. A 260hp Cummins QSB6.7 turbo diesel powers the T260 and it travels on a heavy duty steel track undercarriage with 2-speed final drives. The operator-friendly cabin is fully sealed and climate controlled with A/C, heat, LCD control panel, joystick controls, and a heated suspension seat. The T260 utilizes a 40-inch diameter by 3-inch thick cutter wheel with 36 Monster Tooth cutter tools to power through stumps. Cutting dimensions allow for 108-inch cutting width, 40-inch depth, and 59-inch height without repositioning. The cab tilts for easy access to critical hydraulic components. (1-800-392-2686; raycomfg.com)

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Tigercat 470 mulcher

Tigercat’s new 470 mulcher, equipped with the Tigercat FPT C87 Tier 4i 245 kW (328 hp) engine, is narrow and agile with extremely low ground pressure, rated at 20.9 kPa (3 psi). The 470 is designed for tough terrain and sensitive site ROW, pipeline maintenance and oil and gas exploration projects. It is equipped with an efficient, high-capacity cooling system with a variable speed fan and automatic reversing cycle, a dedicated attachment pump and an efficient closed-loop track drive system. Inside the cab, the operator has ergonomic electronic joystick steering with CRF (counter-rotate function) for “turning on a dime” at the touch of a button. The heavy duty steel engine enclosure and pre-cleaner guard eliminate the requirement for a rear canopy. All structural components are designed for full-time forest duty. (www.tigercat.com)

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Vermeer SC362 stump cutter

Vermeer’s new self-propelled, compact, high-horsepower SC362 stump cutter is equipped with a 35-hp (26.1 kW) Vanguard gas engine and belt-driven cutter head, ample power to remove medium-sized stumps. It features a hydraulic drive system and front-wheel steering for ease in maneuvering. A two-speed ground drive system allows for fast transport, and at only 50 inches (126.5 cm) wide, the SC362 easily gains backyard access. It has a 47-inch (119.4 cm) cutting width, and the optional AutoSweep system monitors engine speed and automatically adjusts the cutter wheel sweep rate to maximize productivity and reduce premature wear. A 17-inch (43.2 cm) cutter wheel is equipped with the Yellow Jacket cutter system, featuring universal and reversible carbide-tipped teeth, with two cutting edges on each tooth and more side pocket clearance, which limits pocket rubbing. The user-friendly operator presence system minimizes operator fatigue and is designed to automatically stop the cutter wheel when the operator’s hands leave the control levers for more than one second. Easy-to-access service points aid in scheduled machine maintenance and inspections. (vermeer.com)

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Force Control MagnaShear motor brakes

Force Control Industries’ new MagnaShear motor brake employs oil shear technology, designed to provide longer service life even in demanding applications such as the frequent start/stop cycles seen on cranes, hoists and winches. Oil shear technology is designed to transmit torque between lubricated surfaces – thereby eliminating wear on friction surfaces. A patented fluid recirculation system dissipates heat – eliminating heat build-up, which is the most common problem in dry braking systems. Elimination of the wear significantly increases service life and virtually eliminates adjustment, which also elongates maintenance intervals. The oil shear technology also provides a smooth “cushioned” stop, which reduces shock to the drive system, further extending service life of downstream components. The totally enclosed MagnaShear brakes are impervious to moisture, dirt and dust, with seal integrity for harsh and washdown environments. A modular design /assembly allows for ease of servicing and maintenance.

Mini-Jarraff Rear Lot Trimmer

Jarraff Industries’ new Mini-Jarraff Rear Lot Trimmer is specifically designed for residential and municipal tree trimming. With a minimal footprint and compact profile, the Mini-Jarraff’s patent pending, self-leveling carrier allows it to travel on all types of terrain and eliminates the need for traditional outriggers. The Mini-Jarraff can retract to 36-inch traveling width – small enough for standard gates and backyard fencing. The remote controlled Mini-Jarraff offers a dynamic range of operation including a 360-degree rotation, rotating saw head for precision cutting, and a 54-foot vertical reach. (www.jarraff.com)

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Delaware Arborist & Tree Care Seminar
Long Neck Beach, DE
Contact: Kyle Hoyd, www.DelawareTrees.com

March 4-5, 2014*
MGIA 27th Annual Trade Show & Convention
Suburban Lake Showplace, Novi, MI
Contact: www.landscape.org

March 5, 2014
Women’s Arboriculture Conference
Harrison Hot Springs, BC, Canada
Contact: www.womenarborists.ca

March 5-6, 2014*
Certified Treecare Safety Professional/CTSP Workshop
Hilton Garden Inn, Windsor, CT
Contact: 1-800-733-2622; peter@tcia.org

March 6, 2014
EHAP Workshop
Elkhart Environmental Center, Elkhart, IN
Contact: 1-800-733-2622; www.tcia.org Ind. Calendar

March 7-8, 2014*
Maine Arborist Association Annual Meeting
Portland, ME
Contact: www>MaineArborist.org; (207) 623-6430

March 8, 2014
Chipper Operator Workshop
Portland, OR
Contact: 1-800-733-2622; www.tcia.org Ind. Calendar

March 11, 2014
Webinar: Simplifying OSHA Compliance: 2-3 p.m. EST
Contact: dlee@tcia.org; www.tcia.org

March 11, 2014*
A300 Tree Care Standards Workshop
Grand Prairie, TX
Contact: 1-800-733-2622; www.tcia.org Ind. Calendar

March 11, 2014
Community Tree Conference
Stockbridge Hall, UMass Amherst, MA
Contact: www.UMassGreenInfo.org; (413) 545-0895; eweeks@umext.umass.edu

March 13, 2014
Chipper Operator Workshop
Oklahoma City, OK
Contact: www.tcia.org Industry Calendar

March 13-14, 2014*
2014 Garden State Tree Conference
Tropicana on the Boardwalk
Atlantic City, NJ
Contact: NJArboristsISA@gmail.com

March 18-19, 2014*
52nd Annual Minnesota Shade Tree Short Course
Bethel University, Arden Hills, MN
Contact: www.cce.umn.edu

March 20, 2014*
Chipper Operator Workshop
Fontana, CA
Contact: 1-800-733-2622; www.tcia.org Ind. Calendar

April 2-3, 2014
Urban Tree Research Conference
University of Birmingham, Edgbaston, UK
Contact: www.charteredforesters.org

April 5-10, 2014*
Western Chapter ISA: Arboriculture on Parade
Pasadena, CA
Contact: www.wcisa.net

April 11, 2014
Chipper Operator Specialist Workshop
Marietta, GA
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April 16-17, 2014*
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Maugat headquarters
Arcadia, CA
Contact: 1-800-733-2622; peter@tcia.org

April 17, 2014
Chipper Operator Specialist Workshop
Garden State Bobcat Group
Freehold, NJ
Contact: wendy.hopkins@morbark.com: 1-800-831-0042

April 30-May 29, 2014 (10 days)
Arboriculture I – Basic Tree Climbing
Quail Hill Scout Camp, Manalapan, NJ
Contact: (732) 833-0325; www.caanj.org

May 5, 2014
Chain Saw Safety
Quail Hill Scout Camp, Manalapan, NJ
Contact: (732) 833-0325; www.caanj.org

May 13, 2014
CPR & First Aid
Quail Hill Scout Camp, Manalapan, NJ
Contact: (732) 833-0325; www.caanj.org

May 20, 2014
Electrical Hazard Awareness & Aerial Rescue
Quail Hill Scout Camp, Manalapan, NJ
Contact: (732) 833-0325; www.caanj.org

May 27, 2014
Chipper, Stump Grinder, Skid Steer Awareness Training
Quail Hill Scout Camp, Manalapan, NJ
Contact: (732) 833-0325; www.caanj.org

June 8-10, 2014
Trees Florida
Innisbrook Resort, Palm Harbor
Contact: www.TreesFlorida.com

July 31-August 1, 2014
Certified Treecare Safety Professional/CTSP Workshop
Milwaukee WI
Contact: 1-800-733-2622; peter@tcia.org

August 2-6, 2014*
ISA International Annual Conference and Trade Show
Milwaukee WI
Contact: www.isa-arbor.com

August 13-14, 2014
Certified Treecare Safety Professional/CTSP Workshop
La Quinta Hotel, Hayward, CA
Contact: 1-800-733-2622; peter@tcia.org

November 13-15, 2014*
TCI EXPO 2014
Hartford Convention Center, Hartford, CT
1-800-733-2622; dmorgan@tcia.org; www.expo.tci.org

February 8-12, 2015
Winter Management Conference 2015
Cabo San Lucas, Mexico
1-800-733-2622; dmorgan@tcia.org; www.expo.tci.org

* Indicates that TCIA staff will be in attendance
OSHA’s Electric Power Generation, Transmission & Distribution, 29 CFR §1910.269

The so-called “Vertical Standard” governing line-clearance tree trimming was promulgated by federal OSHA in 1994. The Tree Care Industry Association’s involvement began in 1982, when National Arborist Association (NAA) Executive Director Robert Felix and a coalition of NAA members began making regular visits to D.C. The rule was published with known deficiencies, and discussion of its revision began almost simultaneously with its release. The last public comment period was in early 2006, with a limited re-opening in 2010 to address Minimum Approach Distance tables.

As you read this, the revised rule has either just been released or will be released imminently. This article summarizes what parts of the rule might change that would impact the tree care profession. TCIA’s extensive 2006 comments are briefly summarized below.

The proposed standard appropriately exempts us from “host-contractor” requirements. OSHA seeks to place the host employer in charge of policing its contractors. This is very problematic when the nature of the contractor’s job and its attendant risk are materially different than that of the host employer; and is not consistent with good business practice.

TCIA opposed the “fall protection” revision in 1910.67, requiring aerial lift operators universally to wear full-body harness fall protection, despite the increased potential for contact with potentially injurious tree limbs and/or potentially deadly electrical conductors below them.

We lobbied for the employer to have the freedom to choose fall protection most appropriate for the specific hazards its employees faced.

We opposed OSHA’s new “Note 2” to 1910.269(a)(2)(vii) that at least with its literal interpretation would forbid any person to be hired and to commence work until the employer spends considerable time to “…supervise the employee closely until that employee has demonstrated proficiency in all the work practices he or she will employ.” The employer must be allowed to rely on an employee’s documented prior work experience and must be able to take a graduated approach in monitoring the employee as he performs new tasks with attendant new risk.

We objected to OSHA’s proposed removal of the existing §1910.269(a)(2)(vii), which requires employers to “certify” that employees have received the training required under that section. Ostensibly, OSHA sought to make this change in order to reduce the record-keeping burden for employers, while the industry viewed this requirement as an effective means of documenting employees’ competence.

We asked OSHA to keep existing 1910.269(b)(1)(i), which allows employers to train all employees in CPR within three months of being hired instead of having two CPR-trained persons on every field crew. This provision was placed in the standard in recognition of the industry’s high employee turnover, and needs to remain for that same reason.

We did not support a provision requiring the employer to provide AEDs to field crews.

We asked OSHA to adopt a new definition of “line clearance tree trimming” so the standard would apply not only to vegetation management within 10 feet of electric supply lines, but to all vegetation management work carried out by line clearance tree trimmers.

At this point we can only wait to see what OSHA attempts to promulgate before we discuss any next steps. Hopefully in the next issue we will be reporting what requirements the OSHA final rule actually contains.
Developmental pruning is the art of training a tree to grow as a single stemmed structure through the practice of pruning. If left untouched for many years, trees will often develop problems for the next generation of homeowners and arborists that will be difficult to solve or mitigate. Although there are other reasons for developmental pruning, we will mainly focus on one, the future structure of a young deciduous tree.

The ultimate purpose is to mimic the structure of a forest-grown tree, which has fewer included bark unions and over-stretched limbs. Some other reasons developmental pruning may be used is for restoration pruning after storm damage, or for fruit harvest. It is best to start early while trees are small, vigorous, and easy to manage.

Timing is imperative when pruning young, impressionable trees. Do it at the wrong time of the year and you may cause more harm than good. The best time to prune is during the dormant season, for a few reasons. Without the leaves on the tree, the structure and growth habit are more visible. Being able to step back and see the progress of your pruning is very helpful. It can also be easier to access the limbs that you are aiming to prune.

Pruning in the dormant season also helps reduce the risk of spreading disease such as oak wilt and Dutch elm disease. According to the USDA Forest Service regarding oak wilt, we should “avoid unnecessary pruning and prune in winter whenever possible.” If pruned during the spring, the time at which the tree is expending most of its energy, you may cause unnecessary stress.

Timing may also depend on if you are pruning for flower or fruit production. Crape myrtles flower on new wood so it is best to prune in the winter, while pruning dogwood or redbud after bloom is beneficial because they flower on old wood. If pruning fruit trees for structure, winter is the best time of year, while pruning after...
flower bloom is best for thinning fruit production.

Tools required for developmental pruning may depend on the size and species of tree you are pruning.

It’s time to begin. This is a great time to take a picture as a “before and after” reference. This could be used for your own research/files or to help show the customer what is being accomplished with developmental pruning.

Begin by walking around the tree to evaluate it. Although the tree is likely small, start with a basic pre-climb inspection. Once you’ve completed that, begin to look at the overall structure of the tree, defects in the crown, and its branching habit.

Raising

While looking at the branching habit, identify the lowest permanent branch that you would like to keep. This will be your first scaffold limb. Everything below this limb should eventually be removed or subordinated to expose your first scaffold limb; this may not be accomplished in a single visit. The ANSI A300 states that, “raising shall consist of pruning to provide vertical clearance.” How high you need to raise the crown or how high your first scaffold limb is will depend on the activities occurring around the tree. If in an open field or park, you may be able to leave it quite low. But if pedestrian or vehicle traffic is common, you may have to raise the limbs several feet above head height.

Whether you continue onto developmental pruning may depend on how much you must remove to raise the lower limbs to a safe height. If you remove one-third of the tree’s canopy, developmental pruning should be delayed until the following year. Caution must be taken to stay below or at the one-third rule. This could all depend on the size of the tree you are pruning. It would be best to avoid pruning small trees for pedestrian or vehicle traffic because in doing so, you may remove more than one-third of the tree’s canopy.

Crown cleaning

Now that the tree has been raised, taking care of the basics – crown cleaning – comes next. According to the ANSI A300, “cleaning shall consist of pruning to remove one or more of the following non-beneficial parts: dead, diseased and/or broken branches.” This will also be a good time to remove or subordinate limbs that have included bark in their branch union. Crown cleaning should be done before developmental pruning. Otherwise, you may unintentionally subordinate or remove limbs that may be an integral part of the structure after crown cleaning.

This is a good time to evaluate how much live material has been removed from the tree. When pruning young- to medium-
Aged trees, it is best to stay under or around one-third the tree’s canopy per growing season. If you had to remove a lot of live material while crown raising and crown cleaning, this may not be the best time to developmentally prune. If you haven’t removed a lot of live material, you can begin to prune for performance.

Developmental pruning

If there are multiple central leaders, start by choosing which one you are going to save. Usually the most central, straightest leader having the fewest limbs with included bark is the best candidate. It may not always be the tallest one that you choose, but it will likely be the tallest one when you’re done.

Once you’ve chosen your central leader, you can begin to subordinate the surrounding leaders. Some may be reduced to help form future limbs; others may be reduced each pruning session until it is appropriate to remove them all together. Remember, as with all reduction or subordination cuts, the lateral that is being cut back should be at least one-third the size of the parent stem.

Now you can begin to work down and around the tree choosing scaffold limbs. According to Edward F. Gilman and Sharon J. Lilly in Best Management Practices – Tree Pruning (Revised 2008), “For small trees, scaffold limbs should be at least 12 inches apart and on medium-aged trees, at least 18 inches.” (Gilman & Lilly 2002).

Remember it is always helpful to step back and take a look at the tree after a couple of pruning cuts. If it looks like you’ve taken more than one-third off the tree, stop and come back in two or three years. Developmental pruning is not pruning once and you’re done. Your client needs to understand that it is an ongoing project that will need to be revisited every few years. Although this will likely turn into a multi-year process, the results will be astounding in relation to safety and aesthetics.

A properly pruned tree with a single stem should outperform a similar tree that is not pruned.

Tyler Altenburger is an ISA Certified Arborist and a staff arborist at Longwood Gardens. Located 30 miles west of Philadelphia, in Kennett Square, Pennsylvania, Longwood Gardens is one of the world’s great gardens, encompassing 1,077 acres of gardens, woodlands, meadows, fountains, and a four-acre conservatory. Visit www.longwoodgardens.org.
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Contact us at 800-788-ROPE or arbor@sterlingrope.com to learn more and request a sample.
When the arborists and tree care specialists at Limbwalker Tree Service in Louisville, Kentucky, finish working for the day, they put their gear down in assigned cubbies along a wall of the shop. Before they leave, they wipe dirt off their handsaws and put them in a plastic 5-gallon bucket. A wire cage prevents the handles from slipping into the bright blue Barbicide solution that the blades soak in. Yes, you read that right – Barbicide. The disinfectant you see in glass jars at any salon or barber shop in the country.


First, why would you disinfect tools at all? Chris O’Bryan, certified arborist and co-owner of Limbwalker Tree Service, says disinfecting tools helps prevent the transmission of diseases such as fire blight and Dutch elm disease from one tree to another. For example, a handsaw that was used to prune an elm tree infected with Dutch elm disease comes into contact with the fungus that causes the disease, therefore increasing the chance of transmission to the next tree.

Disinfection had been on O’Bryan’s mind for a while before Barbicide appeared in the shop. He began researching methods of disinfecting tools in 2011 when he realized that he could be spreading diseases from tree to tree during winter prunings, when signs of disease aren’t necessarily visible. After looking online, he found two possibilities: bleach and Lysol.

He tried bleach first, but there were too many disadvantages. It damages clothes and can burn skin. Plus, according to a publication by Linda Chalker-Scott, a horticulturist at Washington State University, bleach can ruin tools. Prolonged contact with bleach causes pitting to metal blades, and those pits create a friendly space for bacteria.

Then O’Bryan gave his employees cans of Lysol, so they could spray handsaws and pruning shears between jobs. Chalker-Scott’s fact sheet says Lysol is an effective, less corrosive disinfectant. That is, if it gets used at all. O’Bryan says it was nearly impossible to get anyone to take time to spray their tools out in the field. He knew he’d need a solution that didn’t disrupt work routines.

A year into researching disinfectants, O’Bryan was getting his hair cut and noticed the barber’s comb and scissors sitting in the jar of Barbicide on the shelf. Connecting the dots, he thought that if barber’s tools could sit in Barbicide and be disinfected, so could an arborist’s.

Barbicide has been a fixture in salons and barber shops since 1947 when a germaphobic high school chemistry teacher developed the solution in his bathtub. According to Leslie Roste, national director of education for BlueCo Brands, Barbicide stops viruses from replicating, kills bacteria and prevents fungi from growing. This means that, at least in theory, Barbicide could kill the bacteria that cause fire blight and prevent the fungus that causes Dutch elm disease from growing. No formal studies have been conducted to test Barbicide’s effectiveness on plant diseases, but in 2012, O’Bryan decided to try it out in the field.

Unlike other disinfectants, Barbicide contains a rust inhibitor, so it doesn’t ruin tools.

O’Bryan also likes Barbicide because it’s convenient and widely available. In the 5-gallon bucket, he mixes half-gallon of Barbicide concentrate with 4½ gallons of water. He changes the solution every six months so a gallon container of Barbicide concentrate lasts for a year. Barbicide products are available at beauty supply stores nationwide and online.

The one-step bucket disinfection system used at Limbwalker Tree Service is a precautionary measure. For known cases of disease, O’Bryan recommends taking a spray bottle or handheld container of Barbicide and spraying or dipping the blades between cuts. This method prevents the spread of a disease within the tree canopy.

Using Barbicide in tree care is still an experiment for the arborists at Limbwalker. There aren’t any numbers yet on how many cases of fire blight or Dutch elm disease have been prevented by disinfecting pruning tools in this manner. O’Bryan says he’d like to see further research and testing on this method, but he feels that any prevention is worth the simple steps of dunking handsaws in a bucket at the end of the work day and pulling them back out in the morning.

Amy Talbott is a freelance writer. Chris O’Bryan is a certified arborist and co-owner of Limbwalker Tree Service, Inc., an accredited TCLA member company located in Louisville, Kentucky.
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President Obama, in his State-of-the-Union address in January, extolled the benefits of compressed natural gas (CNG) technology and explained, “Businesses plan to invest almost a hundred billion dollars in new factories that use natural gas. I’ll cut red tape to help states get those factories built and put folks to work, and this Congress can help by putting people to work building fueling stations that shift more cars and trucks from foreign oil to American natural gas.”

CNG and LNG (Liquefied Natural Gas) are set to become strong alternatives fuels for service trucks in the tree services industry. The technology is not new, but it is very much improved according to Cummins Westport Inc., manufacturers of CNG engines offering higher displacement technology and adding more horsepower and torque than models available as recently as 2012.

CNG and LNG differ in their composition. CNG is lighter than air and is contained in high-pressure tanks. LNG is a super-cooled liquid and is kept between -184 F and -274 F. CNG is much safer and is lighter than air, so any leakage will dissolve in the atmosphere. LNG offers a longer range between fueling.

Con-way Transportation, a 5.6 billion dollar corporation, reported purchasing an additional 113 Freightliner CNG tractors, equipped with the Cummins Westport ISX 12 G engine, for their Texas intrastate operations in January 2014.

Cities, driven by shrinking municipal budgets and public demand for clean air, are converting entire fleets to CNG. Glendale, California, is coordinating their fleet-management and tailoring CNG build specifications to their various needs. Some municipalities, such as Columbus, Ohio; Mesa, Arizona; and Clearwater, Florida, are converting transit busses and garbage trucks to CNG as they look to increase future cost savings with smaller vehicle engines and converting their fleets.

Municipalities are also building their own CNG infrastructures and pumping-stations to generate additional savings. Currently, the cost difference between gasoline and CNG is over $1 per gallon when purchasing from public refueling-stations. However, by building their own pumping-stations, companies can save $2-$2.50 per gallon.

The ROI on modifications, or upfits, depends upon a number of factors. However, the single biggest factor is fuel savings. For example, a truck with a standard Cummins diesel engine costing $100,000 might costs an additional $20,000 after incorporating the upfit. That additional $20,000 expense will be amortized quickly when saving $2 a gallon; at 10,000 gallons, or after driving 60,000 miles (average 6 miles per gallon), the break-even point is reached.

Small engine CNG conversion packages start at around $8,000 per unit, plus the labor to perform updates.

Chris Weiss, vice president of engineering with Knapheide Manufacturing Co. in Quincy, Illinois, explains, “It is a completely additive cost, because the CNG system replaces many of the gas system components. Upfits can range anywhere from $8,000 to over $20,000 depending on what size of engine and how much fuel/range the customer wants. That break-even point is completely mileage dependent.”

Weiss said that engine providers, such as Cummings, Detroit, International and Ford all offer the same hardened components and so all can be retrofitted with various CNG systems, “CNG adds another level of complexity to their vehicle, so the fleet operator has to be comfortable with the quality and service from that system. We have several partners providing CNG systems including Landi Renzo, Venchurs and Westport. Fleet managers should get the same life and performance out of their (CNG) engines.”

For fleet managers, the real saving comes from building an infrastructure that will allow the natural gas provider to pump directly to their yard or business, thereby eliminating the middlemen. Weiss contin-
ues, “One drawback to CNG is infrastructure, either there is not enough around to support a fleet, or the cost is fairly high for a fleet to install that infrastructure.” There are over 1,300 stations offering CNG in the United States, and most major cities have several to choose from, and that number is set to increase substantially; however, depending upon a company’s center of operations, there could be a lengthy drive to refuel.

For fleet owners, many states are providing tax incentives and grants for building private pumping-stations and converting gas or diesel engines to CNG. Each state has different incentives and the federal government has many programs, each tailored for specific alternative fuels. The Department of Energy (DOE) coordinates all these various tax breaks and incentives through “Clean Cities Collaboration,” which acts as ombudsman to ease red tape and direct the business to the best incentives available.

In Texas, for example, a popular program contains this incentive: “Texas Natural Gas Vehicle Grant Program will provide reimbursement up to 90 percent of incremental cost for replacement or repower of medium and heavy duty vehicles greater than 8,500 pounds GVW. Eligible engines: BAF V10 (6.8L), CWI ISX12G. Must apply and purchase through participating dealers.”


Dave Peabody, with Peabody Landscape Group in Columbus, Ohio, which also operates a large tree nursery, recently converted seven service trucks to CNG fuel systems while also installing a pumping station and natural gas storage tank. The infrastructure and build cost about $360,000 for the CNG plant and about $10,000 for each truck conversion. Peabody’s employees did much of the infrastructure work. Start-up costs were partially offset with a grant from the DOE of $119,000 and a state tax credit of $30,000 for infrastructure. The company plans to add a truck-conversion each week until the fleet is transformed. In addition, the company will recoup about 50 cents per GGE (gasoline gallon equivalent). Peabody hopes to start a co-op offering their pumping station to members who have CNG trucks. Peabody’s CNG cost currently runs about 60 cents a gallon. The hope is to cut fuel expense by $110,000 a year and Peabody has calculated, “Each vehicle needs to travel 12,000 miles a year for us to start recouping our costs. We’ll easily do that.”

From an OEM standpoint, Knapheide’s Weiss says, “Freightliner and Peterbilt have a good presence in the medium duty segment especially with all the bucket trucks and chipper bodies. Ford has the most well-rounded lineup. For many fleets, especially outside of the tree service industry (i.e. multi-department municipalities), they go with a lot of the Ford brand because they have a complete offering of vehicles for all applications.”

Chassis are available with OEM alternative-fuel engines, or with gasoline or diesel engines converted to operate on an alternative fuel by installing an emissions-certified conversion system. “As part of our turn-key installation capabilities,” Weiss says, “we can install CNG conversion kits as well as do our own high-pressure design for best placement of tanks and optimized range for the customer. In the second option, we would buy and install the low-pressure or engine kit and then design the high-pressure lines and the tank placement where it makes sense in the application.”

Freightliner has entered the medium-duty truck market with their factory-built CNG engines, featuring several different chassis models. Greg Treinen, segment manager, Freightliner Trucks, a division of Daimler North America, explains, “The M2 112, featuring the Cummings Westport ISL G, is the best option for the tree care market, with its low cab height, excellent visibility, and maneuverability. All natural gas components, including the engine, fuel system and tanks, are factory-installed at Freightliner’s Mount Holly, North Carolina, plant. Given the available facto-

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TREE CARE INDUSTRY – MARCH 2014 29
ry-built engines out on the market, the ISL G is the best for this market, with horsepower of 320 and torque up to 1,000 lb ft. It’s also 10 decibels quieter than a comparable diesel engine, so it runs quieter when running on residential streets.”

According to Treinen, because of the additional initial cost for building CNG, best savings can be realized when trucks consume 10-15 thousand gallons of fuel per year. And he agrees that fuel savings and pollution control are the key reasons that CNG is growing, but also offered that CNG is a domestic product often supplied by local sources.

Treinen adds that tree care fleets should consider the added weight of CNG tanks, as well as the additional space those tanks take up on the chassis. And because there is not yet a national infrastructure for CNG stations, availability is a point of concern when fleets need to travel long distances to assist with major storm clean up.

Alternative fuel engines and powertrains are now being packaged by their manufacturers to be a direct replacement for their diesel counterparts. A Cummins Westport CNG engine, for example, is configured to mount in a chassis just like a diesel engine does, and an Allison parallel hybrid transmission can mount in the same space as a standard automatic transmission.

Jeff Wyatt, CEO of Venchurs Vehicle Systems, a Qualified Vehicle Modifier for Ford Motor Co., explains that CNG is not only much less costly but also dramatically reduces maintenance costs while extending the life of the vehicle. Wyatt echoes Treinen’s assertion of the benefits of local suppliers of CNG, “This allows us to use a domestically produced natural resource that’s readily available here in the U.S., reducing our dependency on foreign oil at a time when our national security depends upon it.”

So the benefits of CNG appear to be numerous and include:

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prices have exhibited significant stability compared to oil prices and, historically, natural gas prices have exhibited significant price stability compared to the prices of petroleum-based fuels. This stability makes it easier to plan accurately for long-term costs.

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- Same mileage as (or better than) gas or diesel.

Fleet managers have options to convert existing low-mileage trucks to CNG or to buy new from a manufacturer, although the types of power chassis are limited, or to purchase trucks with the specific engine they want and then have after-market suppliers build a specified CNG fuel system. No one-size-fits-all program exists.

The biggest determinant is the added initial investment and trying to determine when that added cost can be recouped. In addition to higher start-up costs, the fact that a complete fueling infrastructure has not yet been realized is a problem for smaller companies who cannot afford building private infrastructure, and, as mentioned, those traveling great distances or into unknown areas, such as for storm work.

Still, as public and private buyers of tree services are looking to the tree services industry to be leaders in the green movement, CNG offers a clear alternative to carbon fuels, and they can lead to substantial savings for many fleets in the industry. With the President of the United States praising the advantages of CNG, businesses set to invest billions in production, and considering the unreliability of supplies of gasoline and diesel fuels due to disruptions from the Middle-East, tree care fleet managers should at least consider this alternative to diesel and gasoline engines.
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In 1986, Will Russell Jr. founded Chippers: Your Land Enhancement Crew, in Woodstock, Vermont. A large number of farmers – especially dairy farmers – were leaving the profession and the land, and newcomers were arriving in the area from Boston and New York wanting to reclaim and rejuvenate abandoned fields and forests, says Mundy Wilson Piper, owner and general manager of the company, and the former widow of Russell, who passed away in 2010 (she has since remarried another widower, Win Piper).

“Will was the visionary for Chippers,” she says. “He had the very first chipper in the neighborhood. But in addition to acquiring the best tools and equipment for the trade, he had a knack for attracting and retaining the very best employees with diverse skill sets to form a really strong team. He began with hiring our superior senior operations manager, Jason Eaton, in 1997.”

Piper joined the company in 2000, with a background in business and management. She and Russell were married in 2004. “Since the beginning my focus has been on financial management, infrastructure and systems development, strategic planning and marketing,” Piper says. “Working for Chippers was a dream come true. I love what our company does, I love the people, and I love making our clients happy.”

A consumer poll in the Valley Business Journal, a newspaper publisher based in Rutland, Vt., in 2013 voted Chippers the best landscape and lawn company in the Upper Valley area. They also just received a “Business of the Year 2014” designation from the Woodstock, Vt., Chamber of Commerce. Some 85 percent of their customers are residential and 65 percent rural. They’re very oriented toward environmentalism and sustainability, Piper says.

The company has evolved through the years, beginning with a merger with Treescapes, in Lebanon, New Hampshire, in 2002. “We’d been taking care of large properties. Adding Treescapes brought professional arboriculture, PHC and fine pruning into our fold. We delved into tree preservation, and the former owner, Cal Felicetti, remains with us as a sales consultant and consulting arborist.”

“In 1996 we became incorporated as Chippers Inc., and when we bought Treescapes in 2002 we realized the tagline of ‘Your Enhancement Crew’ didn’t fit us any longer. So we focused on Chippers, with a lower case ‘c’ when used for marketing,” Piper says.

In 2005, they acquired French’s Tree Service in Meredith, N.H., which had a niche crane business of removing very large trees on small properties in the Lakes Region. This also diversified the sizes of the properties they serve, from a thousand acres or more to as few as half an acre. The former owner, Phil French, remained with them as a sales consultant until he passed away in 2009.

In 2008 they added Turf and Soil Care, headed up by Theron Peck, formerly of TruGreen. They also became accredited, the first company in Vermont to do so.

“Becoming accredited completely made sense for who we are,” Piper says. “It resonated with our striving every day to do better. Long before we became accredited, we were on the path of continuous improvement.”

The year 2009 was a major turning point for the company. Piper calls it “The Year of Survival.” Their business decreased 30 percent from the year before, which was an enormous blow, she says.

“The recession and the rigorousness of Accreditation were a strengthening experience,” she says. “We focused on everything we needed to do to survive.”

The Accreditation process took about eight months.

“By having to go through all the
processes and systems, we found holes,” she says. “Accreditation really made us realize that we wanted to be professionals and leaders.” It also has improved their reputation and lowered their insurance costs. “Our increased attention to safety made a difference in lowering our mod rate and helped us keep it low.”

They standardized their practices in all three offices, improved their systems, and became more efficient. This past year they eliminated their Forest Planning services (now subcontracting those services) and added more IPM with natural and organic products, and began maple sugaring.

“Where we live, we have a solid nine months to do tree work and a solid three months of winter,” Piper says. “It’s (maple sugaring) a way to keep people employed through the shoulder season. We’re committed to giving really good people year-round, full-time employment. That’s how we’ve developed such a great team of people over the last 15 years.”

Their written estimates are now completely based on the ANSI A300 standards. They improved their safety program. They became more familiar with Department of Transportation (DOT) safety regulations and developed more documentation of training and violations, with follow-ups from near misses on the job to foster learning and prevention. They have one Certified Treecare Safety Professional (CTSP) for every 10 employees.

They increased the number of safety meetings, to daily meetings of all crews, a minimum of 40 hours of arborist or forester safety training per year, annual hazardous materials training, and CPR and First Aid training.

Their land enhancement division makes vista improvements and strengthens woodlots by strategically removing trees and by planting trees to add diversification and to provide breeding and cover areas for wildlife. They also design and build trails for recreational uses.

Their tree care division does pruning, tree and shrub planting, and transplanting of trees up to 9 inches in diameter or 25 feet in height. Customers can select large trees for their properties from Chipper’s tree nursery in Woodstock. They also do cabling and bracing, lightning protection, and tree removal, including emergency

“If having to go through all the processes and systems, we found holes ... Our increased attention to safety made a difference in lowering our mod rate and helped us keep it low.”

Mundy Wilson Piper
hazardous tree removal, stump grinding, brush chipping, field mowing and excavation.

Their PHC services include IPM, soil amendments, foliar applications, tree and soil injections for insect and disease control, and a custom blend of fertilizers.

Their consultation services cover arboriculture, landscape health assessments, the selection of trees and shrubs, tree protection pre- and post-construction, turf assessments, shoreline protection, erosion control, and garden design. They also do pre-winter audits for storm damage prevention.

The company has some 29 employees in the field in Woodstock, 20 in Enfield, and seven in Meredith. As part of the Accreditation process, they hired a full-time human resources manager, John T. Keefe Sr.

“No now we have a great hiring system,” Piper says. The HR manager hires – and occasionally fires – by the company’s core values. These include conducting business with safety and integrity as its main concerns, and encouraging a workplace that people enjoy coming to.

“Chippers’ employees have positive attitudes always, we work really hard, we try to be open and honest in all our communications, and we’re dedicated to our clients.” In addition, Piper says, employees are very protective of each other, which is one reason the company has such a good safety record.

“I am most proud of our staff,” she says. “We have an amazing team of committed, talented and professional people who work incredibly hard every day. Our customers say they are always smiling and courteous, and they leave their property in better condition than they found it.”

The vast majority of their work comes from clients and their referrals.

“We’ve always had excellent rapport with clients and an internal system of addressing all complaints and/or misunderstandings since the company began in 1986,” she says. “In 2012, we implemented a one-question survey on our invoices asking clients how likely they were to refer a friend or colleague to Chippers. I am so very proud that our 2013 Net Promoter Score was 9.6 out of 10 on this survey, with 253 responses!”

Chippers performs a number of community services, including hanging and taking down Christmas lights for the Village of Woodstock, donating funds and labor to non-profit organizations, and planting trees in playgrounds. They also hold a Community Beautification Initiative every year, for which they perform a day’s worth of work, from tree planting to field mowing, free of charge.

“We get a stack of proposals every year,” she says. “The hard part is deciding which projects to do.”

Their hard work is paying off. “We had an awesome 2013,” Piper says. “It was our best year ever. In the future, as consumers and agencies become more aware of the requirements of Accreditation, we’re expecting that’s what will help carry us forward. And Accreditation makes it easier for new growth in the future because we have these standards in place, fostered by the process itself.”

“Accreditation makes it easier for new growth in the future because we have these standards in place, fostered by the process itself.”

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Accident Briefs

Taken from published reports or reported directly to TCIA staff, as noted.

Landscaper electrocuted using pole saw

A landscape worker was electrocuted January 4, 2014, in Winter Park, Florida, when he touched a pole saw to a power line. A second worker was also shocked but was recovering.

A crew of four men from a Sanford, Fla., landscaping company was trimming trees when the victim, Delvin Reynoso, 22, touched a metal pole saw to the power line. A witness described seeing the worker hanging upside down in the tree surrounded by smoke, adding that it was clear he was no longer alive. Rescuers reported that Reynoso died instantly, according to WESH and WPTV TV/NewsChannel 5 reports.

Another worker, Francisco Hernandez, was on ladder touching the tree and was also shocked, but was recovering at the hospital and expected to survive.

Two other co-workers called 911 and had to wait for power to be shut off. One of those two workers said that they all knew to stay at least 12 feet from power lines and he believed what happened was an accident.

Tree firm owner dies of asphyxiation

A man killed while cutting branches from a tree January 18, 2014, in Fairburn, Georgia, apparently died of asphyxiation.

Tim June, 21, of Roswell, Ga., was about 60 feet off the ground working on a pine tree when a cut branch struck him. The Fairburn Fire Department dispatched a ladder truck to the site, where firefighters worked carefully to extricate June and lower him to a waiting ambulance.

At first, rescuers thought June had died from the force of the limb striking him. A physician determined he’d actually died of head and neck compression, according to the Fulton County Medical Examiner’s Office.

June was the owner of Atlanta Tree Assurance, founded last year. June had been cutting trees for three years and recently decided to start his own company, according to a report in The Atlanta Journal-Constitution.

Falling tree crushes crew member

A man working with a crew cutting trees in East Texas was killed January 22, 2014, after a 20-foot section of tree fell on him.

Lucio Vasquez, of Groveton, Texas, was dead at the scene, on private property at a rural site near Pollok, about 125 miles northeast of Houston. Authorities said Vasquez and several other people were part of a tree-cutting crew using heavy equipment and chain saws, according to an NBC 5–KXAS report.

Bucket operator dies in fall

A tree worker fell 40 feet to his death from an aerial lift truck bucket while trimming a tree January 25, 2014, in Forsyth, Georgia. Jose Luiz Martinez, 39, of

(Continued on page 55)
CTSP CEU Quiz #2014-2 March 2014

1. Today's lightweight chain saws:
   a. are no longer equipped with vibration control systems
   b. are equipped with spark arrestors
   c. have not undergone significant changes since the 1940s
   d. should have the chain brake removed before use in the field

2. To assure a crane pick does not swing or roll:
   a. small wedges are used to stabilize the piece
   b. use a handsaw to make the final cut as it will keep the piece balanced
   c. chokers and balancers can be used
   d. make one continuous chain saw cut from front to back

3. Kickback is caused:
   a. by the chain being too dull
   b. when something comes in contact with the upper quadrant of the bar tip
   c. by the leading edge of the cutter tooth being lower than the chain raker
   d. when something comes in contact with the upper side of the bar

4. The chain saw part that protects the operator's trigger hand is:
   a. the rear handle guard
   b. the chain catch
   c. leather gauntlet style gloves
   d. the chain brake

5. Repetitive motion injury can occur from:
   a. chain saw operators positioning their thumb on top of the handle, rather than around the handle
   b. extended chain saw use on larger pieces of wood
   c. dropping a saw from a tree
   d. drop starting a saw several times a day over the course of many years

Certified Treecare Safety Professionals can earn one (1.0) “professional development” CEU toward their recertification by taking this short comprehension quiz that is tied to this month’s safety articles in this issue of TCIA Magazine. The CTSP CEU Quiz is a bimonthly feature in TCIA. This quiz is based upon information in the article: “Chain Saw Safety: Keeping the Fundamentals in Mind,” by Keith Norton, page 14.

To obtain CEU credit, you may copy this page, answer the questions and either fax the answer sheet to TCIA at (603) 314-5386; scan and email it to ctsp@tcia.org; or mail to: TCIA - CTSP, 136 Harvey Road - Ste 101, Londonderry, NH 03053.

* Only current CTSPs in good standing who qualify for professional development CEUs may obtain CEUs for this quiz. Other readers are encouraged to use TCIA’s safety articles for training and may wish to use this quiz to test comprehension.
DID POLAR VORTEX DEAL DEATH TO INSECT PESTS of TREES and SHRUBS?

By Michael J. Raupp, Ph.D.

Just a year ago in the February edition of TCI Magazine, we explored the effects of rising global temperatures on the distribution and abundance of insect and mite pests in landscapes with particular attention to the effects of urban heat islands on pest outbreaks (Raupp 2013). Some of the phenomena we explored included the range expansion of arthropods to higher altitudes and latitudes as lethal low temperatures retreat further north and higher up mountains as evidenced by devastating pests such as mountain pine beetles in western North America (Klapwijk et al. 2012). We learned how small pests like aphids, spider mites, and lace bugs might be able to complete more generations each year due to compression of their life cycles under warmer ambient temperatures. Phenology is the study of life cycle events such as the hatching of insect eggs or flowering of trees in relationship to seasonal climatic changes in the environment. In a warming world, researchers have noticed distinct phenological changes in plants, and insects and mites that attack them. For example, in heartland states such as Ohio, the annual appearance of black vine weevil begins roughly two weeks earlier each year than was observed just a few decades ago. Humankind’s contribution to climate change remains a debatable point, however, the scientific community generally agrees that temperatures around the world are increasing, particularly so in the Northern Hemisphere (Hansen et al. 2006).

But Mother Nature is capricious, and thus far in early February, the winter of 2014 has been record setting in many parts of the United States, particularly in states east of the Rocky Mountains. A series of polar vortices descended on the United States from Canada plunging many parts of the country to record low temperatures not seen in decades. In early January, temperatures in Central Park, New York, fell to 4 F, shattering a record that stood since 1896, and the big chill broke records as far south as Florida. We have explored what a warming world means for insect and mite pests, but is there any good news to be found in the frigid temperatures observed throughout the country during the winter of 2014? Let’s look at a few case studies.

Will honeylocust escape ravages of mimosa webworm?

Mimosa webworm, a noxious invasive caterpillar from Asia, is a key pest of honeylocust, a tree native to North America widely planted along streets and as specimens in landscapes. In an important study of honeylocusts and webworms in Iowa, Hart et al. (1986) found that damage to honeylocust was significantly less following cold winters and much greater following warm winters. Prolonged temperatures below freezing, 32 F, resulted in significant mortality of webworm pupae

Wax scales, a large group of tropical and subtropical species, may also have suffered significant mortality in recently invaded northern states.
(Miller and Hart 1987). During very cold winters where temperatures approached -22 F, mortality of overwintering pupae was nearly 100 percent. In springs following cold winters, fewer adults emerged from pupae, fewer eggs were laid, and fewer caterpillars were present to damage trees. The converse happened following mild winters. In mild winters, more pupae survived and more adults were produced. This translated into more caterpillars that caused significantly more defoliation.

Many locations in the upper Midwest and eastern United States likely experienced temperatures well below those necessary to inflict mortality on mimosa webworm and we hope to see a reduction in populations of this pest and its associated damage.

Will frigid weather in the Midwest help tame emerald ash borer?

Emerald ash borer, an invasive metallic-looking, wood-boring beetle from Asia, is one of the premier killers of ash forest, shade and street trees in North America. During the first polar vortex in early January, hopeful reports from the Midwest suggested that bone-chilling temperatures in Minnesota might put a lethal bite on EAB larvae overwintering beneath the bark of ash trees. An important study by Vanette and Abrahamson (2010) projected that when the coldest temperatures reached -10 F, 34 percent of EAB larvae die; but at -20 F, 79 percent of larvae will succumb to the cold.

However, despite optimism that temperatures approached lethal lows in the upper Midwest, EAB expert Deb McCullough (McCullough 2014) of Michigan State University cautioned us not to get our hopes up too much. Many denizens of cold places have evolved the ability to acclimate to frigid winter conditions as the season progresses. Their tiny bodies produce chemicals similar in structure and function to the antifreeze we put in our automobiles’ radiators. This “antifreeze” prevents insect cells from freezing and rupturing due to the formation of ice crystals. In cold environments, this process of acclimation to frigid conditions intensifies through time. Professor McCullough suggested that had the polar vortex arrived in late fall or early winter, the nefarious borer might not have been able to acclimate to rapidly plummeting temperatures. This could have resulted in significant mortality in the beetle. Let’s keep our fingers crossed that in some cases emerald ash borers were not fully prepared for the onslaught of the polar vortex.

Did eastern cold put the chill on hemlock woolly adelgid?

This sap-sucking invader from Asia has killed millions of eastern and Carolina hemlocks from Maine to Georgia. It has devastated forest ecosystems up and down the Appalachians and threatens hemlock throughout much of its range in the eastern United States. During January and February, the adelgid exists as wax-covered immature stages called nymphs. These juveniles complete their development in late winter and early spring and initiate a second generation.

While temperatures of well below -20 F appear necessary to kill the majority of EAB larvae, a mere -4 F in January could kill more than 60 percent of hemlock woolly adelgids (HWA), according to a study by Parker et al. (1999). Similar cold temperatures in February or March could kill 80 percent to more than 90 percent, respectively, of adelgids according to this study.

Some good news this winter is that temperatures up and down the east coast from Bluefield, West Virginia (-8), to Manchester, New Hampshire (-20), were low enough to levy significant mortality on the hemlock woolly adelgid. We hope that this chilly winter will provide some relief to our hemlocks throughout their range. Despite the devastation HWA has inflicted on our eastern forests, Parker’s study pro-
vides evidence that some of the geographic range of hemlocks will be inaccessible due to temperatures that are simply too cold for this miscreant to invade.

Will sap-sucking southern visitors disappear from northern states?

One of the most serious pests of fruit crops and landscape plants, cottony cushion scale, was accidentally introduced into the United States in the 1860s where it became a major pest of citrus. This pernicious scale insect typically resides in southern states, including California and Florida, but in 2008 and again in 2013 it was observed in Washington, D.C., and Maryland on elm, holly, magnolia, and nandina in landscape plantings. Its appearance early in the growing season suggests that winters are now mild enough in parts of the mid-Atlantic region to permit survival of cottony cushion scale at least in some years (Gill et al. 2008, 2014). However, temperatures below about 10 F are believed to limit the ability of this pest to survive outdoors (Baker and Frank 2010). With minimum temperatures below 10 F extending as far south as Atlanta, Georgia, perhaps cottony cushion scale will be eliminated from its northern incursion this year. We hope that southern wax scales in the genus *Ceroplastes* will suffer a similar fate.

Chilli thrips is another southern tormentor that has shown up with disquieting frequency in northern states. This tropical and subtropical pest was first detected damaging roses in Florida in 2005, but it has now spread across states bordering the Gulf of Mexico. Chilli thrips is known to feed on more than 100 species of herbaceous and woody plants including camellia, cherry, holly, oak, pear, photinia, pieris, pittosporum, pyracantha, rhododendron, rose, and viburnum (Osborne 2011), where it can complete as many as 18 generations per year in Florida and California.

In spring of 2012, chilli thrips was detected feeding on hydrangea on Long Island, N.Y. Although the hydrangea had overwintered in hoop houses prior to discovery of the thrips, there was concern that
this pest might have survived the mild winter of 2011-2012 outdoors (Gilrein 2012). But this chilly winter may put an end to chilli thrips in places like Long Island and much of the south. Research by Nietschke et al. (2008) indicates that regions with five or more days with a minimum temperature of 25 F may be too cold for chilli thrips to survive.

One of the predicted outcomes of climate change is dramatic fluctuations in weather related events. This year’s spate of winter arctic blasts in several parts of the nation seems to confirm these predictions. As winter melts into spring and spring heats up into summer, we will see if the big chill put a dent in egregious arthropod pests in our landscapes and urban forests.

Michael Raupp, Ph.D., is a professor of entomology in Department of Entomology at the University of Maryland in College Park, Md., and an extension specialist. He works closely with arborists to develop and implement sustainable management approaches for insect and mite pests in urban forests. His most recent book, Managing Insects and Mites of Woody Plants: An IPM Approach, is in its second printing and is available through TCIA, as is his children’s book, 26 Things That Bug Me. Visit Circle 22 on RS Card or visit www.tcia.org/Publications
his blog at www.bugoftheweek.com.

References


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Saving urban trees through growth prediction

By Kenton Rogers

The multiple benefits of urban trees, woodlands and green spaces are well documented. Trees filter pollutants, reduce the urban heat island effect, provide aesthetic interest and can even reduce crime or encourage greater consumer spending. These benefits are even more pronounced in urban areas, helping to make towns and cities better places to live.

Despite the obvious benefits, trees in urban areas are often those under the greatest pressure, facing issues such as increased summer temperatures or pollution levels, compacted soils, salt contamination, development and vandalism to name a few. Consequently, urban tree numbers have been steadily declining.

So how can we reverse this trend of urban tree suffering? The answer lies in growth prediction. By predicting growth of various tree species, researchers and urban forest managers can model cost benefit analysis, investigate alternative management scenarios and choose best management practices for increasing the benefits from trees, all of which create more sustainable urban forests. Selecting, locating and managing trees to provide ecosystem services is becoming increasingly important, and the science of determining urban tree growth is fundamental to quantify these services.

Measuring tree growth

In forestry disciplines, tree growth has been measured for centuries and the relationships between site conditions and management are better understood. Yield tables and production forecasts are avail-

### Table 1: Simple linear growth rates (with standard deviation in brackets)

<table>
<thead>
<tr>
<th>Tree Type</th>
<th>Average Tree DBH increment (cm) per year (with std dev.)</th>
<th>Average Tree Height increment (meters) per year (with std dev.)</th>
<th>Average Tree Canopy (m) increment per year (with std dev.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX</td>
<td>0.556 (0.08)</td>
<td>1.667 (0.25)</td>
<td>3.75 (0.43)</td>
</tr>
<tr>
<td>MIN</td>
<td>0.044 (0.08)</td>
<td>0.372 (0.33)</td>
<td>0.082 (1.15)</td>
</tr>
<tr>
<td>All Average</td>
<td>0.3 (0.17)</td>
<td>0.75 (0.33)</td>
<td>0.84 (1.05)</td>
</tr>
<tr>
<td>Open Grown Tree</td>
<td>0.394 (0.08)</td>
<td>1.455 (0.33)</td>
<td>2.541 (0.97)</td>
</tr>
<tr>
<td>Others Average</td>
<td>0.255 (0.08)</td>
<td>0.645 (0.33)</td>
<td>0.465 (0.97)</td>
</tr>
<tr>
<td>Oak</td>
<td>0.228 (0.08)</td>
<td>0.601 (0.25)</td>
<td>0.588 (0.43)</td>
</tr>
<tr>
<td>Ash</td>
<td>0.4 (0.08)</td>
<td>0.926 (0.33)</td>
<td>0.863 (1.15)</td>
</tr>
<tr>
<td>Syc</td>
<td>0.341 (0.08)</td>
<td>0.84 (0.33)</td>
<td>0.931 (1.05)</td>
</tr>
<tr>
<td>Beech</td>
<td>0.22 (0.17)</td>
<td>0.643 (0.50)</td>
<td>0.635 (0.97)</td>
</tr>
</tbody>
</table>
able for a variety of different species, sites and management prescriptions in many different countries. Unfortunately, the equations and empirical tables developed for plantation forestry are not directly relevant to open-grown urban trees because they are based on even-aged, “pure forests.” Relying on equations developed in traditional forests could lead to huge variances in the growth estimates when applied to urban trees and woodlands.

Existing urban forest growth models revealed that little work has been done in this area. The majority of existing studies are based on public tree inventories where trees of different ages are measured to establish the relationships between age, stem diameter and other growth variables such as crown height or width. As the trees in the studies are only measured at one point in time, public records are essential in providing the age of the trees studied.

Finding a new model

As part of our recent study in the United Kingdom, “Determining Tree Growth in the Urban Forest,” we reviewed these methods and, fortunately, there was an alternative. A. E. Douglas pioneered the science of dendrochronology in the early part of the last century, studying both conifer and hardwood trees from sites in North America and Europe (although he is most well known for his work developing a chronology from the giant sequoia, *Sequoiadendron gigantium*). He demonstrated that the widths of the annual rings correlated with climatic variations and that this pattern also corresponded with patterns of narrow or wide annual rings from different trees in the same area. This is because trees respond to climatic variations such as precipitation, temperature and available sunlight and are excellent at capturing short-frequency variability. It was, therefore, an ideal method to use where no planting records exist.

Study of Torbay, United Kingdom

Working in the Torbay area of Devon, United Kingdom, where there were no planting records available, we aimed to use this method in determining tree growth of four different species (oak, *Quercus robur*; ash, *Fraxinus excelsior*; sycamore, *Acer pseudoplatanus*; and beech, *Fagus sylvatica*) for the last 100 years. In all, 104 core samples (two per tree) were collected from the area during the winter of 2011/12. As well as determining growth rates, growth could also be compared against past meteorological data to establish if there was any significant effect on tree growth.

Data on the ring measurements for each sample were recorded using TSAP-Win software, a platform for tree ring analyses. The two cores for each tree were compared in order to remove any false rings and to insert any missing rings. This process is referred to as cross dating and can be done by visual or statistical methods. A visual approach is preferred for the initial assessment and before any time series analysis is undertaken. Once visually cross dated (and provided the correlation was significant), the data from the two cores were averaged to provide a mean growth increment for each tree. Averages were then prepared for
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The study found that in the urban environment of Torbay, overall growth was greatest in ash, followed by sycamore, oak and, finally, beech (Table 1). In general terms, it was found that growth in Torbay’s trees is greater than that observed in the Eastern European climate zone, but are much less than the general base rates for various U.S. studies. This was reassuring as it is what one might expect.

When growth was compared against the meteorological data, significant relationships were found for the beech, ash and oak, but not for the sycamore. This could mean that this species is either not sensitive to the weather conditions recorded or that it is not entirely suitable for dendroclimatological research. Indeed, we found that the growth rings in the sycamore samples had the greatest variability and were the most difficult to interpret. No significant correlation with the meteorological data was recorded and this may limit its usefulness as a tree for establishing patterns in tree growth for other studies.

Table 2: Event years

<table>
<thead>
<tr>
<th>Year</th>
<th>Average All Beech</th>
<th>Average All Ash</th>
<th>Average All Oak</th>
<th>Average All Sycamore</th>
<th>Average Rainfall mm</th>
<th>Sun hrs/24hr Year</th>
<th>Temp Year</th>
<th>Event Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1933</td>
<td>1,625</td>
<td>5,365</td>
<td>2,500</td>
<td>2,511</td>
<td>1.94</td>
<td>5.30</td>
<td>10.95</td>
<td>Notably warm summer: one of the top 5 or so of the century. Regarded as from June to September.</td>
</tr>
<tr>
<td>1937</td>
<td>1,932</td>
<td>2,560</td>
<td>1,935</td>
<td>2,656</td>
<td>2.88</td>
<td>4.53</td>
<td>11</td>
<td>One of the wettest Februaries across England &amp; Wales (using the England Wales Precipitation (EWP) series.</td>
</tr>
<tr>
<td>1963</td>
<td>1,474</td>
<td>2,036</td>
<td>1,948</td>
<td>2,539</td>
<td>2.52</td>
<td>4.16</td>
<td>9.1</td>
<td>Mt. Agung (Bali, Indonesia/East Indies) erupted Feb. 18. Gas &amp; volcanic dust reached more than 10 km above the crater, high enough to reach the stratosphere. Atmospheric effects, including dramatically colored sunsets &amp; halos around the sun, encircled the earth within a few weeks, a decrease in light was measured from distant stars, at a maximum between Aug. to Nov. 1963, lasting to some extent until mid-1964. Stratospheric temps rose as much as 6 degrees C, and the average world near-surface temperature dropped 0.4 C for 3 years after the eruptions.</td>
</tr>
<tr>
<td>1966</td>
<td>2,380</td>
<td>3,441</td>
<td>2,722</td>
<td>3,933</td>
<td>2.94</td>
<td>4.88</td>
<td>11.26</td>
<td>One of the wettest Februaries across England &amp; Wales (using the EWP series). Rainfall totals over 200% of avg.</td>
</tr>
<tr>
<td>1976</td>
<td>1,272</td>
<td>2,301</td>
<td>1,684</td>
<td>2,212</td>
<td>2.18</td>
<td>5.31</td>
<td>11.24</td>
<td>1975/1976 (May to April): For the EWP series (since 1727), the 12 month period May ’75 to Apr. ’76 was (at the time) the driest. 1975/1976 (two-year drought): The drought of 1975/76 was severe over most of the British Isles, also exceptionally persistent. It produced the highest values for a drought index for southeast England in 300 years.</td>
</tr>
<tr>
<td>1989</td>
<td>2,367</td>
<td>4,321</td>
<td>2,760</td>
<td>2,944</td>
<td>2.5</td>
<td>5.05</td>
<td>12.14</td>
<td>Sunniest year in central London on record, which began in 1929, 1915hr recorded (against 1762hr in 1976). Over a large part of the United Kingdom, one of the warmest &amp; sunniest in the modern (reliable) record. (see also 1959, 1995 &amp; 2003).</td>
</tr>
<tr>
<td>1992</td>
<td>3,210</td>
<td>3,883</td>
<td>2,428</td>
<td>3,842</td>
<td>2.32</td>
<td>4.60</td>
<td>11.41</td>
<td>Warmest May of 20th century over much of Britain, &amp; in top-5 warmest Mays in the entire CET record (others were from 18th &amp;19th century, so some doubt).</td>
</tr>
<tr>
<td>1996</td>
<td>1,949</td>
<td>3,478</td>
<td>2,195</td>
<td>2,744</td>
<td>2.54</td>
<td>4.95</td>
<td>10.71</td>
<td>Driest year in the Heathrow record (started 1947). Coldest year since the mid 1980s as well. A very dry year in the EWP series: 682.2 mm/5th driest in that series (as at 1999).</td>
</tr>
<tr>
<td>1997</td>
<td>2,680</td>
<td>4,034</td>
<td>2,476</td>
<td>3,985</td>
<td>2.38</td>
<td>5.11</td>
<td>12.01</td>
<td>30 month precipitation totals up to Sept. 1997 were lowest on record in England &amp; Wales, with estimated return periods exceeding 200 years in many districts.</td>
</tr>
<tr>
<td>AVG*</td>
<td>2,099</td>
<td>3,491</td>
<td>2,294</td>
<td>3,152</td>
<td>2.47</td>
<td>4.88</td>
<td>11.09</td>
<td>All Notes Sourced from Booty(2012)</td>
</tr>
<tr>
<td>Min*</td>
<td>1.10</td>
<td>2.96</td>
<td>8.81</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*(from all series years – not just those listed)</td>
</tr>
<tr>
<td>Max*</td>
<td>3.17</td>
<td>6.13</td>
<td>12.45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Each species and these correlated well together, both statistically and visually.
poor and good growth years and to see if there were any corresponding meteorological events (Table 2). Results were interesting, for example: 1976 was a key event year, being a severe drought. Poor growth rates were also observed in 1896/7 and 1917, but there was no local data available. Anecdotal evidence suggests however that the winter of 1916 was one of the wettest of the century.

UK-wide surveys to inform urban tree management

Following on from this study, Forest Research UK will be rolling out a similar urban trees survey across five UK cities: Cardiff, Birmingham, Peterborough, Glasgow and Edinburgh. This survey involves taking tree cores from four species of open grown trees: ash, sycamore, oak and silver birch, Betula pendula. It is hoped that their wide geographical spread across the UK will determine any variability in their growth patterns due to climate, thereby increasing our understanding of climatic issues faced by the urban forest. It is likely that in the future such methods will be used for modeling tree growth against different climate scenarios to enable better urban tree management, species selection and a more sustainable future for urban trees.

Note

1. Sometimes, trees also produce growth patterns that appear to be annual rings but are, in fact, “false rings” or “intra annual growth.” This can be caused by drought or other environmental stresses triggering cell wall thickening in the growing season. Conversely, in some years discernible growth rings may not form at all (“missing” or locally absent rings). Locally absent rings cannot be reliably detected in single core samples, and this is why two cores are compared and an average taken for each tree.

Kenton Rogers, is a member of the Institute of Chartered Foresters, a forestry consultant and founder of Treeconomics Ltd., a firm specializing in valuing ecosystem services – the economic, environmental and financial value of trees, forests and green infrastructure, in Polegate, East Sussex, England. He will be speaking on this same subject, how new methods of determining tree growth can create a more sustainable future for city trees, at the Institute of Chartered Foresters conference, “Trees, People and the Built Environment II,” April 2-3, 2014, at Birmingham University, in Birmingham, England. The Institute of Chartered Foresters is the professional body representing foresters and arborists in the United Kingdom. For more information or to registration for the conference, visit www.charteredforesters.org/conference 2014.

The study referenced in the article, “Determining Tree Growth in the Urban Forest,” can be found at www.treeconomics.co.uk/uk-treeconomics-pilot.
Cranes and Cottonwoods
Have you ever noticed that one tree? It’s the one you have gone by for years. You notice it because its shape, size, or condition sets it apart. I had been passing this large eastern cottonwood (Populus deltoides) about a mile from my house for 10 years and wondering when I would get the call. Trees like this one can’t be removed by just anyone, because it takes someone with the right equipment, skill, experience and, perhaps, nerve or foolhardiness. As I casually evaluated the tree over the last 10 years, it continued to catch my attention because of its great size – about 100 feet tall, about 80-inch DBH – and its proximity to the house.

The call finally came in fall 2013. We had removed a nearby tree for the city and the tree owner wanted a bid for removal. The tree worried him for years, and branches had fallen and damaged the house on three separate occasions. To add to the challenge, it had been topped about 30 years previous and the regrowth had developed poor attachments and columns of decay. Our salesman, Rich, gave a proposal and the bid was accepted.

Before we do any job we have to figure out the logistics. When I evaluate a job I generally go through the following checklist and answer the questions before proceeding.

1. Identify the hazards. 2. Identify targets to avoid. 3. Where will the equipment go? Truck, chipper, crane, etc. 4. Where is the drop zone and staging area? 5. Can you get the equipment where you want it? 6. Who will be the climber? 7. Do you have a close, convenient spot to dump chips? When the chipper stops, branches can pile up and production drops off. 8. Can the logs be left on site, hauled away, or given away?

In our market, we often have to bid removal jobs pretty tightly and if we are not efficient it can kill profit; besides the work is hard enough as is and we want to make it as easy as we can. We were three to four weeks out when we got the job and it gave me plenty of time to plan.

The day finally came and we arrived early with our truck and chipper. I wanted to arrive early enough to position the chipper exactly where I wanted it. I am pretty picky about where the chipper sits and the angle of the feed hopper. A bad angle and you may develop voids and not fill the truck efficiently. You might also be fighting branches and logs because they are not in a straight alignment coming off the crane. Branches fed straight into the chipper are less likely to twist unpredictably. Proper set up can save time and frustration, not to mention reduce fatigue, possibly require less limbing, and improve safety.

The crane arrived and as usual we had a pre-job briefing. Besides safety and identification of hazards, our meetings have two main subjects. Where will the crane be positioned in relation to the tree and the drop/landing zone? And what is the procedure for removing the tree? Fortunately we were able to drive under a bundled com-

At right, the author relaxes after a main top is lifted away by the crane.

Facing page, the author takes a ride into the tree. As per ANSI Z133 5.7.13, they tie in above the hook and ball using a 1-inch clevis and a 36-inch false crotch girth hitched to the clevis. All pictures courtesy of the author.
Once the crane was set up, I prepared to tie in. As per ANSI Z133 5.7.13, we tie in above the hook and ball using a 1-inch clevis and a 36-inch false crotch girth hitched to the clevis. I like the girth hitch because it holds the rings in place no matter which ring the spliced eye of the rope goes through. Often if I am using a rope with a thick splice, such as New England Fly, I will use two auto-locking carabiners through the rings to eliminate hang-ups when pulling the rope through.

After tying in, we hooked on a spider leg rigging sling. Over the years we have used crane straps, wire rope, chain, and single leg rope slings. Since first using a spider leg, we almost never use the other methods when removing a tree. The spider leg has a main sling made from 1-inch stable braid with an extra-large spliced eye protected by a cordura chafe sleeve, and a ¾-inch steel shackle in the other end. Two ½-inch Tenex slings on the main sling give you 18 feet each to balance the main load on the 20-foot stable braid sling. Most of our picks we tie with two legs and sometimes three. The added security of a second or third leg is a great backup, and it shares and balances the load. On questionable branches it is easy to back up a running bowline or cow-hitch with one or more half hitches. This shares the load and gives additional security. The ½-inch slings are attached to the main sling with an English Prusik knot and can be adjusted up and down as needed to balance the pick.

We were finally ready to set up our first pick. I now had to entrust my life to the crane operator, Chad Holmgren. We have done more than 200 crane removals together over the years and I value his skills, experience, judgment and efforts to keep me safe. Not every crane operator should do trees. Fortunately, Chad is someone I can trust.

To take on a tree like this is a little daunting and I knew it would be an all-day-plus affair. Fortunately we have an experienced crew. They usually can keep pace by chipping each crane pick before the next one is ready. The side and upper picks went smoothly, the crane was particularly helpful to stand up horizontal pieces, which reduces branch movement and gives more control. Vertical picks are usually preferred because they will normally go up and gently away rather than potentially swinging toward the climber. One of the challenges of removing a topped tree is that instead of having one or several tops, they often have many tops and decay below the parts that are craned out first. On a removal with a lot of decay I typically remove parts from different areas of the tree rather than just one side to avoid unbalancing the tree. I prefer to err on the side of caution.

As I was in the tree, I imagined doing it without the crane. I would have to tie into dead and compromised leads; there is no way would I climb some of those. The tree was too tall for an aerial lift, besides the fact that the tree would be subjected to dynamic loading as it was rigged off itself. I was glad to use the crane – it improved safety and productivity by a large margin.

As the job progressed, at one point the crane got tied up loading logs onto a truck and trailer from the Utah State University Ceramics Department. They really like cottonwood in their wood fired kiln and we were glad to share. The chips went to a local tree farm and a homeowner that was trying to improve her soil. While I was waiting for the crane, we were able to rig and free fall some branches.

The job had gone fairly smoothly going

(Continued on page 69)
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In calendar year 2013, there were 78 fatal and 79 non-fatal occupational injuries reported in the media and/or brought to TCIA’s attention by Google reports, OSHA investigations or reports from colleagues in the industry. The number of fatal accidents reported was very similar to 2012, when we reported 84 fatal accidents; however the number of non-fatal accidents reported here rose sharply from the 44 reported last year.

The average age of the deceased was 40.6 and the average age of the serious accident victim was 37.7 years old.

The companies responsible for these data appear to have been hard at work in 2013, as evidenced by the number of fatalities that occurred on Saturdays and even Sundays.

Looking at the largest fatal accident categories more closely:

Of the 14 Falls from Trees:
- Six could be attributed to failure of the tree or a major limb.
- Two were caused by climbing system failure.
- In one instance, the victim cut through his own climbing system, and in one other the victim was tied to the limb that was cut.

Of the 12 Electrocution accidents:
- Three victims were electrocuted through conductive tools or equipment such as metal saws, gas-powered stick saws, metal ladders and un-insulated lifts.
- Five victims made direct contact with conductors.
- It could not be determined how five of the victims made contact.

There was insufficient detail in the accounts of the 12 Struck-by-Tree fatalities to allow any further analysis, even the average age of the deceased could not be determined from the scant details in the news accounts.

Similarly, the 13 Struck-by-Tree-Limb fatalities lacked enough detail for further analysis.

In the nine Fall-from-Aerial-Lift accidents:
- The victim was not secured in the bucket in six instances. In one of these six cases, the victim’s ejection from the bucket was caused by a cut tree limb striking the bucket.
- There were two cases in which the
upper boom failed, apparently without any external “assistance,” sending the operator to the ground.

• There was one case in which a blow from a falling limb caused the boom to shear off.

Most accounts of fatal tree care accidents identified the employer involved, allowing TCIA to analyze the percentage of accidents that involved its members.

We believe the relatively small number of fatal accidents involving TCIA members is significant. It is our hunch that almost three-quarters (72.2 percent) of all fatal accidents occur among companies with only one-third of the industry’s total workforce.

Non-fatal accidents are not reported in the media with enough consistency and clarity to allow analysis. One graphic, at the bottom of the facing page, sums up the non-fatal accidents better than words.

Accident Briefs

(Continued from page 38)

Gainesville, Ga., wasn’t wearing safety equipment while in the bucket trimming a pine tree in a residential area.

Martinez was part of a four-person crew with a Gainesville-based tree service that included his brother and a cousin. None of the other three crew members saw Martinez fall. They were clearing the ground when they heard something hit the ground. They looked back and the bucket was empty, according to a Forsyth News report.

The Forsyth County Sheriff speculated that the tree or a piece of it hit the fully extended bucket, and that the subsequent whipping action knocked Martinez out of it.

After being alerted to call 911 buy his co-workers, the homeowner tried to revive Martinez with CPR.

Tree worker hurt in 40-foot fall

A 21-year-old tree worker trimming tree limbs for West Penn Power in State College, Pennsylvania, was seriously injured after falling 40-feet January 29, 2014.

The line clearance company employee apparently fell when the limb he was standing on broke and simultaneously his chain saw cut his safety line. The man was transported to Mount Nittany Medical Center before being flown to a regional trauma center, according to a www.state-college.com report.

Send your local accident briefs to: editor@tcia.org

It is our hunch that almost three-quarters (72.2 percent) of all fatal accidents occur among companies with only one-third of the industry’s total workforce.

Upward mobility has a new meaning these days...

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Tree Care Sales Representative, NJ
Self-motivated. Green Industry or Arboricultural background required. Certified Tree Expert or Certified Arborist a plus. Full-time, draw + commission, 401(k) and health benefits. Call 1-800-822-3537; chunt@tamke.com

Crane-assisted Tree Removal, Southern NH
Climber, log truck operator & ground positions. Must have 3-5 years’ exp., CDL & arborist cert. a plus. Competitive wages. (603) 882-0686 or email info@mcguinness.com.

Tree Climber/Crew Leader, IL
Climb trees for pruning and removal & assist crew with cleaning up resulting debris (i.e. brush, branches, logs, etc.). Maintaining the ANSI Z133.1 safety standards & A300 pruning standard in day-to-day operations, full understanding of these standards is crucial. Must have at least 1 year of tree pruning and climbing field experience including the ability to operate all equipment and tools utilized within the climbing industry. The ability to climb rope or tree up to 80’ with equipment and PPE. Morgan.Kittinski@acresgroup.com; (847) 487-5071; www.acresgroup.com/careers/job-search/

Arbor Foreman, Des Moines, IA
Applicant must be able to train, manage and motivate others on your crew. Must be dependable, punctual and have a strong work ethic. Should be an ISA Certified Arborist, if not you will be encouraged to obtain certification within first year of employment. Applicant is required to be able to safely and properly climb trees with ropes and saddle. Must be able to operate and maintain a bucket truck and tree chipper. Must have good communication skills and be able to complete daily paperwork. Must have a valid driver’s license with a class B or above endorsement with a good driving record, we will run an MVR. (515) 987-0800; jobs@wrightoutdoorsolutions.com

Arborist Crew Leader, Williamsburg, VA
Bartlett Tree Experts is currently searching for experienced climbers. The ideal candidates will have 3+ yrs’ experience climbing with rope and saddle in the tree care industry. Candidates must have experience overseeing other employees. We are looking for candidates who are looking for a long-term career with a company. Supervises and manages tree care crew while performing all aspects of tree care services, as directed by the arborist representative or local manager. Understands and demonstrates proficiency in all aspects of the ground person and climber positions. Reviews scope of work and safety issues with the arborist representative prior to beginning each work assignment. Ensures that each crew member is trained appropriately for each designated job assignment. Participates in and conducts all job site safety briefings with crew members. Ensures that all crew members utilize all required personal protective equipment. Great Benefits and competitive compensation. We will assist with relocation for the right candidates. EOE Employer. Having a CDL is a big plus. Email your resume to our ad posted at www.jobs.tcia.org.
Arborist Representative

Bartlett continues to grow in the North, South, Mid Atlantic, Midwest & West with openings for experienced Sales Arborist Representatives, Foremen, IPM Techs & tree climbers. We have locations in Massachusetts, Connecticut, New Hampshire, Vermont, New York, New Jersey, Maryland, Pennsylvania, Virginia, North Carolina, South Carolina, Georgia, Florida, Tennesse, Texas, Illinois, Michigan, Minnesota, California, Washington, Arizona, Canada, UK & Ireland. Bartlett Tree Experts has been in business for over 104 years. We are the largest family-owned tree care company with over 80 offices in the USA. We pride ourselves in offering scientific tree care and have unmatched resources with the Bartlett Tree Research Laboratory. If you are someone who is looking for upward mobility and a long-term future with a great company, then send us your resume. No phone calls please. We offer excellent compensation and benefits. EEO Employer. Opportunity Grows on Trees. Email your resume to our ad posted at www.jobs.tcia.org.

Part-Time Regional Outreach Coordinator – Northern West Coast area

TCIA’s newly created outreach coordinator position will concentrate on creating groups of tree care business owners who meet and interact regularly (face-to-face and online) and facilitating increased participation in TCIA programs via regional workshops that address both owner and employee needs (EHAP, CTSP, etc.). A regional coordinator will live and work in their assigned region to organize member gatherings (breakfasts, after-hour’s gatherings, etc.) where current members interact prospective members are invited to see what they are missing. Coordinator will work to strengthen the visibility of professional tree care through consumer awareness opportunities at events, via social media, and traditional press. Target area for coordinator based in Northern California, however other locations will be considered depending on strength of the candidate, local industry, location and TCIA strategic plans. For complete job description, requirements and application details, visit www.jobs.tcia.org. Resume and cover letter to: Bob Rouse, Rouse@tcia.org.

Tree Surgeon/Climber, St. George’s Bermuda

Brown and Company Ltd. is Bermuda’s premier landscape and tree care service and the Islands only TCIA accredited contractor. We provide the highest quality, industry leading horticultural and arboricultural services to the island, carrying out primarily private residential, with some commercial and resort and Bermuda’s only utility vegetation management contracts. We offer a generous pay and benefits package to the right candidate in a tax free sub-tropical paradise. Climber/Tree Surgeon with at least 3 years’ experience climbing and bucket truck operation. Must have recognized qualifications and/or operators certificates; have a current, solid grounding in all techniques and aspects of pruning, rigging and removals; proven experience in the care and operation of a wide range of associated equipment. Should have a valid First Aid Certificate and a strong grounding and understanding of all current and relevant Health and Safety practices. Electrical hazard training or utility line clearance qualifications and previous experience training junior staff would be a benefit. (441) 297-5521; fax (441) 297-6153 or email martin.brown@brownandco.bm

Bartlett Tree Experts is currently searching for Plant Health Care Specialists, CT

The ideal candidates will have 1+ yrs’ experience working in Plant Health Care OR a 2/4-year degree in Forestry or a related field. Certified Pesticide Applicator License is preferred. We are looking for candidates who are looking for a long-term career with a company. Performs all functions of Plant Health Care: SM, tree injection, root invigoration also including administration, scheduling, inspecting, sampling, treatments, inventories, equipment maintenance, record keeping, report writing, and customer relations. Great Benefits & Competitive Compensation. We will assist with relocation for the right candidates. EOE Employer. See complete job description and email your resume to our ad posted at www.jobs.tcia.org.

Tree Climber, Fredericksburg, VA

Lead & work a tree care crew safely/efficiently & provide high quality tree care. Perform specialized pruning & removals; install cabling & other tree care concepts. Safely operate all tree service related equipment. Excellent customer Service. Must have/be: tree care crew experience; experience with proper pruning practices including large shade trees & ornamentals. Ability to identify tree & shrub species & have a working knowledge of each. An expert in safe chain saw/equipment and bucket truck operation. Able to climb without spur. Valid driver’s license (CDL preferred). We offer the best equipped & trained team around with an emphasis on quality & safety. Full Range of benefits & paid time off. Drug free work place. (540) 710-9665; goodfellerco@hotmail.com

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Bartlett Tree Experts is currently searching for experienced climbers. The ideal candidates will have 3+ yrs’ experience climbing with rope and saddle in the tree care industry. Candidates must have experience overseeing other employees. We are looking for candidates who are looking for a long-term career with a company. Supervises and manages tree care crew while performing all aspects of tree care services, as directed by the arborist representative or local manager. Understands and demonstrates proficiency in all aspects of the ground person and climber positions. Great Benefits and competitive compensation. We will assist with relocation for the right candidates. EOE Employer. Having a CDL is a big plus. Email your resume to our ad posted at www.jobs.tcia.org.

Arborist Foreman, Dallas, TX

Bartlett Tree Experts is currently searching for experienced climbers.

The ideal candidates will have 3+ yrs’ experience climbing with rope and saddle in the tree care industry. Candidates must have experience overseeing other employees. We are looking for candidates who are looking for a long-term career with a company. Supervises and manages tree care crew while performing all aspects of tree care services, as directed by the arborist representative or local manager. Understands and demonstrates proficiency in all aspects of the ground person and climber positions. Great Benefits and competitive compensation. We will assist with relocation for the right candidates. EOE Employer. Having a CDL is a big plus. Email your resume to our ad posted at www.jobs.tcia.org.

### Arborist/Sales Representative – Boston’s North Shore

An outstanding career opportunity with an industry leader! Carpenter Costin Landscape Management has provided arboricultural solutions to the North Shore, Merrimack Valley, and Greater Boston area for over 65 years and strives to meet an excellence in quality unmatched in the industry. We are currently seeking an Arboriculture Sales Representative to handle an established territory. Ideal candidate must have at 3-5 years’ experience in green industry sales. Certified Arborists are preferred. Prepare estimates on sales consultations; supervise your job’s work crew; build relationships with clients and partners; maintain client database with Salesforce.com.; manage and expand existing client base. Join the growing team and earn excellent pay and benefits. Forward resume and cover letter via email, jobs@carpentercostin.net, or fax (781)595-5850. Contact Bonnie at (781) 598-1924. For more company info visit www.carpentercostin.net.

### Trim Field Supervisor, Arborist Foreman

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Victoria McCarthy
Arborist

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Climbers/bucket truck operators, crane operators

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Experienced Climber Position, CT

Medium-sized tree care company seeking an experienced climber with a CDL, who is also skilled in rigging, pruning, crane work, utility lines, and large takedowns. Drug-free workplace and highly competitive benefit packages including hourly pay between $15 and $25, health insurance, profit sharing, and 401(k). Relocation package for the right candidate. Signing bonus available! Fax or email resume to (203) 272-0393 or arborist@totaltreecare.com.

Production Manager/Safety Coordinator

Growing tree company in Denver, CO, is looking for a knowledgeable energetic individual to manage our tree trimming department and give meaning to our tagline, Integrity in Action. Must have field experience, communication skills, a CDL, and be ISA certified. Duties include scheduling jobs, setting pruning standards, training new hires, conducting our safety program, and overseeing equipment maintenance. Email resume to rosstree@rosstree.net to join our team.

Climbers, Arborists, Interns, SC

We appreciate trees, we love people and we enjoy excelling with the best professionals. We are offering career opportunities and internships to individuals who are seeking a career in the arboriculture industry, with job stability and room to advance. Every employee is considered an investment and every investment has a future. Each individual is rewarded with the best of benefits that include personal attention, excellent training, vacation, holidays, competitive pay, medical, 401(k), bonuses, education opportunities, and a safe work environment. Check us out on our website at www.soxandfreeman.com or contact chris@soxandfreeman.com to apply for a fresh change.

Manager and Crew Leader, Omaha, NE

ABS Tree Care is currently seeking motivated Arborist interested in taking the next step in his/her career. We have openings for both management and production employees. We are seeking motivated team players who are looking to advance their career. We believe in investing in and developing our people. We put a high value on character and integrity. Insurance, retirement, paid vacation and profit sharing. (402) 960-8667; cfustrial@cox.net Manager: PHC and tree trimming/removal sales experience; setting and achieving sales and production goals; Certified Arborist. Production: Climber/bucket operator; CDL; Drug Testing.

Arborist, Raleigh, NC

Bartlett Tree Experts is currently searching for experienced climbers/crew leaders. The ideal candidates will have 3+ yrs’ experience climbing with rope and saddle in the tree care industry. Candidates must have experience overseeing other employees. We are looking for candidates who are looking for a long-term career with a company. Supervises and manages tree care crew while performing all aspects of tree care services, as directed by the arborist representative or local manager. Great Benefits and competitive compensation. We will assist with relocation for the right candidates. EOE Employer. See complete job description and email your resume to our ad posted at www.jobs.tcia.org.

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Plant Health Care Specialists, Waldwick, NJ

The ideal candidates will have 1+ yrs’ experience working in Plant Health Care OR a 2/4 year degree in Forestry or a related field. Certified Pesticide Applicator License is preferred. We are looking for candidates who are looking for a long-term career with a company. Performs all functions of Plant Health Care: SM, tree injection, root aeration also including administration, scheduling, inspections, sampling, treatments, inventories, equipment maintenance, record keeping, report writing, and customer relations Great Benefits & Competitive Compensation. We will assist with relocation for the right candidates. EOE EmployerSee complete job description and email your resume to our ad posted at www.jobs.tcia.org.

Seacoast NH - FT/yr round - Generous Benefits

Exp Climber: must have knowledge of the climbing position for pruning, removal and proper use of equipment. CDL-A and arbor certification required. Send resume/ref to: info@seacoasttreecare.com

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Having been an arborist for more than 20 years, I can say that I have seen many changes in our industry. I not only own and operate a small tree care service; I am an adjunct instructor at Paul Smiths College, a private forestry college in the Adirondack Mountains of upstate New York. I have not only trained my own employees, I have also taught countless students how to perform the basics of arboriculture field work, and have had the great fortune of interacting with arborists from all over this country.

One of the most encouraging changes that I have witnessed is the advent of technical clothing and personal protective equipment in our industry. How many of us have been hampered while working in clothing that just wasn’t made to move like we do? How many times have you come home only to dump a pile of woodchips from your cuffs and pockets on the floor of the house? Have you ever ripped your clothes at work? We all realize that our work is hard on people and even harder on clothing. These issues may sound like minor annoyances, but what if you never had to worry about remembering chaps, or fogged up and scratched safety glasses again?

In the not-so-olden days most arborists were wearing clothing that was easily found at local outdoor gear and clothing stores. Some tree climbers would utilize gear that was designed for rock climbing or mountaineering, but the majority simply made due with work clothing that was locally available. While this clothing “worked,” the introduction of technical clothing and gear specifically made for arboriculture has provided options that were not previously available. Clothing and personal protective equipment specifically made for arborists has many advantages that can improve safety, comfort, productivity and even the image of our industry.

First and foremost in any discussion regarding personal protective equipment is to understand what that phrase defines. The American National Standards Institute (ANSI) Z133 General Safety requirements for arboricultural operations states that: “personal protective equipment (PPE), as outlined in this section, shall be required when there is a reasonable probability of injury or illness that can be prevented by such protection.” The Occupational Safety & Health Administration (OSHA) requirements are “performance – oriented,” and require the employer to identify hazards. So, an article of clothing or protective equipment must be suitable for the specific work at hand. TCIA has a great compliance guide and checklist in their “Illness & Injury Prevention Program,” so if you are not sure what PPE you need, this is a helpful source of additional information and interpretation of the requirements.

Boots

Let’s begin our discussion from the ground and work our way up. ANSI standards do not mandate that arborists wear safety-toe boots, so we as a profession have had the liberty to choose to wear anything that is “appropriate to the known job hazards and approved by the employer,” while OSHA mandates that, “The employer shall ensure that each affected employee uses protective footwear when working in areas where there is a danger of foot injuries due to falling or rolling objects, or objects piercing the sole, and where such employee’s feet are exposed to electrical hazards.”

Working in the arboriculture field may
necessitate having different kinds of footwear to protect against the dangers of that particular job. PHC techs may opt for rubber boots, climbers may want a boot that accommodates the use of spikes, or a technique such as foot locking, and someone working felling trees may choose to have a boot with saw protection or safety toes. Thankfully there are boots that hit the market lately that you may want to take notice of. First, there are indeed some chain saw cut-resistant boots such as the Meindl Air stream, and Pfanner Zermatt boots, which are similar to a hiking boot and provide an alternative to the traditional logger boot. Because of the added protection, they are stiff and quite a bit heavier than a traditional hiking boot. Other boots are specifically made for tree climbing (without chain saw protection), such as the Arbpro EVO tree climbing boots, which have a soft rubber sole for better grip on the bark. They are also designed to grip the rope better and do not have metal eyelets so they lend themselves to the foot-locking technique.

Pants

We owe a round of thanks to the folks at Arborwear for developing and mass producing pants that are comfortable and durable for climbing. Their ad campaigns featuring their canvas pants and catchy lines got everyone’s attention. Since then, technical pants made of synthetic fibers have been introduced by Arborwear, SIP, and other manufacturers. Sure these pants are quite a bit more expensive than traditional work pants, but the functionality and ruggedness of these pants are well worth the investment. Besides, it’s no fun to wear soaking wet cotton when you can wear synthetics that dry quickly and provide added benefits that are not offered in traditional pants such as zippered pockets, preformed knees with scuff patches, cuff closures, stretch fabric and even with some pants, chain saw protection.

ANSI and OSHA standards mandate that we wear chain saw protection while working on the ground and for good reason. According to the U.S. Consumer Products Safety Commission, in 2008 alone there were 27,170 reported chain saw injuries, the majority of which were in the lower body. While many professionals are moving toward the same protection while working aloft, it is not a standard yet. Companies such as Pfanner and Viltom make chain saw pants for arborists that provide maximum protection and optimum mobility. Since many workers in our industry perform a variety of duties at each job site, it is nice to have the ability to wear one pant that performs several functions, all while meeting our industry’s safety criteria.

One common workplace hazard that can be avoided by investing in chain saw pants is that when chipping brush and a quick cut needs to be made in order for a branch to go through the chipper, an operator wearing chain saw pants can simply cut the branch and proceed with chipping; otherwise the operator must don a pair of chaps, make the cut and then take the chaps off again to avoid the potential of being sucked into the chipper by the chap straps.

The cost associated with these technical pants could scare away potential first-time buyers, but it is important to consider the benefits. These pants outperform traditional pants by protecting against chain saw cuts, ticks, and exposure to the elements, while providing amazing comfort and durability. One common complaint about chain saw protective pants is that they are too warm in the summer months. There are summer and winter weight options available as well as some styles that have zipper vents and utilize lightweight breathable material. Due to the fact that newer chain saws are becoming more efficient at cutting and the chain is moving faster than on old saws, in 2008 chain saw protection standards changed to increase the requirement to stop a moving chain, from 2,500 feet per minute to 2,750 feet per minute. European requirements are 3,900 feet per minute, but the testing of the materials and whether or not it is an electric saw or a gas-powered saw are different.
To the core

Other than long sleeve shirts for some specific duties, we have the freedom to choose the best tops for the each day’s activity. Tree work is hard, and we are athletes in a non-traditional sense of the word. Where I live in northern New York, it is not uncommon to have temperature swings of more than 20 degrees in a day and even if the weather is dry, perspiration can be just as much a problem as precipitation. Shirts and undergarments that wick moisture away from the body are always a good choice and the options and availability are better than ever.

I remember carrying a couple of extra cotton T-shirts around in the truck so I could change into a fresh one before talking to the client. Synthetic materials not only provide warmth while wet, they dry quickly and often provide UV protection and anti microbial benefits.

Jackets and outerwear

For tree climbers, these items don’t typically fall into the scope of ANSI or OSHA, but are important nonetheless. Arborwear, Pfanner and Viltom Extreme have produced jackets and vests that are functional and durable. The stretch fabric is comfortable and resists tears, water and even most oil based liquids so you don’t have to worry about offending your co-workers and clients with … well you know! You can also use them as a base layer in the winter months because they will wick moisture away from your skin and help keep you warm.

Using your head

Accident statistics show that falls from heights (trees, aerial lifts, etc.) and struck-downs are unfortunately common in our industry. Having a helmet that has a retention system and fits properly will certainly help protect workers during an accident.

New helmet systems are the rage for arborists. ANSI and OSHA have specific guidelines for eye, ear and head protection. First, ANSI states that, “workers engaged in arboricultural operations shall wear head protection (helmets) that conforms to ANSI Z89.1. Class E helmets shall be worn when working in proximity to electrical conductors in accordance with ANSI Z89.1. Workers shall not place reliance on the dielectric capabilities of such helmets.” OSHA general requirements section 1910.135 refers to the ANSI Z89.1 standard.

Arborist-specific helmets have several design features that make the helmet safer and more comfortable to wear. As part of promoting and maintaining a safety culture, we must be cognizant of the fact that if it’s not comfortable (or “cool”) to wear PPE, chances are workers simply won’t! Features on these helmets may include integral chin straps, extra suspension and improved impact resistance (remember the more points of contact, the more the impact is distributed throughout the head), ratcheting adjustments, high visibility schemes, venting, and some models also incorporate eye and ear protection.

It is important to note that traditional mesh-style face screens do not meet ANSI standards for eye protection, and safety glasses must be worn in addition. However, Polycarbonate visors, such as on the Kask and Petzl helmets, do meet ANSI Z87.1 standards for eye protection. One notable benefit of poly face shields is that they don’t fog up like safety glasses, and you never have to wonder where you set them down! These helmets are somewhat more expensive, but the safety, comfort and convenience features can far outweigh the extra cost.

Several manufacturers make eye pro-
tection that is comfortable, stylish and, most of all, safe. One problem with safety glasses and hearing protection is that they have a relatively short life span. Once glasses become scratched from work or rolling around on the dash board of the chip truck, no one wants to wear them. One option for prolonging the life of your safety glasses is a visor clip to hold safety glasses to the visor in the truck while not in use.

Fred Ravetto, vice president at Elvex Corporation, which has been producing PPE since 1978, states that there are not sufficient standards for testing hearing protection equipment and there can be a wide range in protection amongst products. Be sure to look for noise reduction ratings of 27-29 decibels. Let’s face it, hearing protection is not only important, but it is also tends to be the most often replaced component of our personal protective equipment. Disposable foam plugs should be replaced daily, and there are sanitation kits available for your ear muffs to replace cracked gaskets and tired foam. Many arborists use a combination of hearing protection, including ear plugs and muffs. Whatever combination you choose, be sure that it fits properly, and meets standards. Hearing loss is irreversible and tinnitus (constant ringing in your ears) can cause stress, distraction and constant annoyance every second of every day for the rest of your life.

Employers are required to provide personal protective equipment to the employee at no cost, however employers may make the employee pay for equipment that is lost, or intentionally abused and damaged, or exceeding the standards. An employee may choose to use their own PPE and the employer is not required to reimburse them. Climbing gear is also considered to be personal protective equipment and to be provided by the employer, but covering all of the advancements in climbing gear would be an entire separate article!

So what does the future hold? Suppliers are providing a variety of options and manufacturers are looking into new fabrics that are cooler and more functional.

There are many benefits to the use of technical clothing and personal protective equipment. Today’s arborists have several options available to them that can make their work easier and more productive. While many of these products are still quite new, there seems to be enormous interest in them not only because of safety factors, but also comfort, durability and style. Don’t be fooled into believing that safety takes too much time or costs too much money. And don’t believe for one minute that our industry is fraught with hazards that we just have to accept and live with. We must all do our part to reduce hazards and injuries. Safe work practices and the use of personal protective equipment will help make our industry safer and more productive.

Daniel Groves is an adjunct instructor at Paul Smiths College, a private forestry college in Paul Smiths, New York, in the Adirondack Mountains of upstate New York.
Hurray. Yet another book of knots. There are thousands of books out there that show thousands of knots. So what makes this book worthy of placement in the TCIA store? This is a book solely of working knots and hitches for the everyday production arborist.

There is no extra baggage, like Pratt knots or man-o-war knots or anything you don’t need to sift through when looking for a tree worker’s knot. All of the main knots, hitches and loops that arborists use every day are presented in close proximity, so time spent stalking a particular knot is limited.

The fact that Knots at Work: A Field Guide for the Modern Arborist was written, edited and illustrated by production climbers is another commendable reason to pick it up. Jeff Jepson is a 30-year veteran of production climbing, and has taken the knots he and his crew use daily and ordered them in this very suitable paperback.

The work of the production arborist is intimately tied to knots. Some knots used in rigging operations might be tied and untied as many as 100 times or more during a single tree removal. Repetition in practice helps recall how to tie knots, but creative imagination will expand their use beyond work applications. Jepson encourages the reader to instruction. He reminds us that “rope is useless, and even dangerous, without the knowledge and the will to master the skills necessary to select, tie, and use knots properly.” That is the main goal of the book. Selecting the right knot for the right use, then tying it correctly.

This compact paperback features (among many other topics) knots and hitches recommended for DdRT and SRT climbing, work positioning and anchor systems. Knots and hitches used in rigging are also detailed. An easy-to-use cross-referencing system is arranged to make it easy to navigate the sections.

One of the best features of Jepson’s book is the one-glance knot directory on the inside of the front and back covers. This means you can avoid hunting through the back of the book for an index. So handy! What is in the back, though, is a great knot application guide that walks you through your choices on when to use a certain knot or hitch. Good illustrations and easy-to-understand text answer any “why?” questions when deciding when to use a particular knot.

I particularly enjoyed the quote about “sudden hammock failure” by Jan Adkins. It is a good reminder that rope angles and forces not only inhabit our work places, but then tend to follow us home as well.

Happily, the knots represented in this book have evolved with the production climber well into the 21st century. Jepson gives us a better understanding of these knots and their varied applications. He explains how knowing which knot to correctly tie, and for what uses, may just prevent you from unintentionally shortening your career.

The use of knots is the origin of tree climbing. Yes, there are tons of shiny innovative gadgets now that help the climber snake through the tree without the need to tie, dress and set, but the starting point behind those innovations are the arborist-specific knots and hitches. Keep the basics in front of you. Keep this book of Knots at Work in front of you.

Knots at Work: A Field Guide for the Modern Arborist is available from TCIA. To shop online, visit www.tcia.org and click on “Shop.”

Tchukki Andersen, BCMA, CTSP and TCIA’s staff arborist, spent 20 working in the field – as a production arborist, PHC specialist and structural pruning whiz.

Letters & Emails

Hot item

The idea that we lose 80 percent of our body heat from our heads, as stated in my article “Working in Winter,” in the February issue of TCI, is a myth. The origin of this notion is from some cold water research that the military did decades ago and has recently been proven false. Using modern heat sensing equipment, researchers have found that we lose body heat throughout our core and major muscle areas as well as our head and neck. Dressing in proper clothing and in layers is still our best defense against the cold!

Daniel Groves
Adjunct professor, Forestry Division
Paul Smith’s College, New York

Send letters & emails to: editor@tcia.org

Yes, there is such a thing...

The TCIA staff would like to thank the anonymous TCIA member for treating to a free lunch the staff holding down the fort in New Hampshire while other staff were at Winter Management Conference last month. We know he reads TCI start to finish every month ... so, thank you!
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into the afternoon, it was now time to switch saws and get into the big wood. Big wood can be a particularly challenging and dangerous part of the job for the following reasons:

1. Rigging large pieces can be difficult to tie into – sometimes there are limited side branches to help secure the sling and it can be tough to get the sling positioned properly. 2. Big wood weighs a lot and special consideration must be given when determining load capacity of the rigging gear and crane. 3. Generally by this point in the job the climber has been climbing, cutting, and rigging all day and may start getting tired. 4. Big saws are more difficult to start and maneuver in the tree. 5. The escape route and mobility of the climber may be limited. It can be difficult to maneuver quickly, especially when the climber’s tie-in is below the cut.

We proceeded to start on the big wood and worked our way up to using a Stihl 066 with a 42-inch bar. I like the longer bars at times because, with limited mobility, I can cut all the way through rather than having to work my way around the stem to a less mobile and more vulnerable position. As we worked our way down and around, we came to a large piece with a column of decay and cavities. I rigged it carefully to the crane, descended, retied in and began to cut. After going about half way through I got a surprise when a large raccoon climbed out of the top of the piece I was cutting. He stared at me and me at him. We

(Continued on page 69)
Cranes & Cottonwoods

(Continued from page 68)

both contemplated our situation and decided to call a truce. He climbed back in the tree and I finished the cut. He rode the log to the ground and escaped unharmed. Judging by the cavities and other evidence, it seemed like a raccoon palace. I am glad we only found one.

After cutting the height down to where his home. I kept the butt end of the tree – no longer had the potential to hurt him or his home. I kept the butt end of the tree – my kids want me to hollow it out so they can make a lemonade stand. Even though the log is big and decayed, perhaps it can be repurposed and have a new life.

Cranes work can be challenging and the magnitude of hazard can be greater than a conventional job. Done properly it can improve safety and productivity especially on large, compromised, or dead trees. The ANSI Z133-2012 and Best Practices for Crane Use in Arboriculture, published by TCIA, should be considered tools as important as chain saws and rigging slings when doing crane work.

Mark Malmstrom is a Certified Arborist since 1994, and has owned and operated Total Tree Care, Inc. in River Heights, Utah, since the year 2000.
By Bobby Burritt

Growing up in beautiful Hawaii and having many years of coconut palm trimming behind me, I have found just about anything you can imagine – trash, money, business cards, mail, etc. – in the crowns of these palms that birds and rats can carry up there. But it’s not only the rats and birds – I once found a machete likely left behind by a previous trimmer, as this tool was – and sometimes still is – commonly used by immigrants from Polynesia hired for trimming in Hawaii, though you won’t find any recommendations for its use in the ANSI standards.

I thought I had seen it all.

While recently trimming nearly 20 coconut palms (*Cocos nucifera*, a tree of the palm family *Arecaceae*) on a vacation rental property, I came to one that wasn’t trimmed as often, being shorter than the rest and positioned so as not to be a threat of damage or injury if a nut were to fall. The tree was loaded with more than 100 coconuts.

Being the last task of the day and feeling confident with my crown inspection, I allowed my ground worker to approach the landing zone to grab a couple of cocos. While he cleared, I had taken a breather, holding onto an overhead palm frond more for balance than support, when out of nowhere – BAM! – something hit my hard hat HARD, and a rock the size of a soft ball rolled off of my shoulder!

I yelled in panic to my ground worker as the rock landed about 3 feet from him.

My first instinct was that the rock had lodged during transplant. But upon a more thorough crown inspection, I found two more rocks, this time the size of tennis balls. They appeared to be stuck there for some time and were impossible to spot from the ground. I had dislodged the one while holding onto the frond that had held it in place.

After the initial shock wore off, we realized the tourists who rented the property must have thrown the rocks at the palm thinking they could make the coconuts fall. I can tell you from a lifetime of experience, knocking a coconut from its perch with a rock would be a difficult if not impossible feat. But in such a beautifully abundant and friendly place, all they had to do was ask for one.

Note to visitors: If you have a chance to visit our island paradise and have a craving for coconut, please leave the rocks where they are – for the sake of your fellow arborists. Coconuts are plentiful and you can find one for a fair price, anywhere from $2 to $5 each, at local markets. Beware the street vendors, who sometimes try to charge as much as $10 for a nut that likely cost them less than a dollar.

Bobby Burritt works with Convergent Conservation, a TCIA member company located in Lahaina, Hawaii.

TCI will pay $100 for published “From the Field” articles. Submissions become the property of TCI and are subject to editing for grammar, style and length. Entries must include the name of a company and a contact person. Send to: Tree Care Industry, 136 Harvey Road, Suite 101, Londonderry, NH 03053, or editor@tcia.org.
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