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OUTLOOK

Team Building

Perhaps no other management term is so overused—and so infrequently achieved—than that of team building. Countless courses have been designed, and books written, about a concept that is so important to an organization’s ability to create a user-friendly environment in which to establish and meet mutually agreed upon objectives. In my opinion, it is also the best way to motivate employees, raise organizational standards and develop fellow workers to their highest level of achievement.

But how to do it ... that is the question. No doubt, there are many ways, but here are a few general suggestions.

First, create an atmosphere of mutual respect and trust. Let employees know that there are no “stupid” questions or ideas, and that it is okay to make mistakes. What is really important are the lessons you learn from your “failures.” Subordinate your personal ego to that of the organization or group.

Second, in this climate of respect, develop together a shared vision of where the organization should head and the steps to take to get there. Work together to develop team and individual goals and create procedures that nurture and enhance communication, connection, self sacrifice and personal achievement.

Third, communicate, communicate and communicate. Probably no other failure has led to more human tragedy and unhappiness than communication. Respect and listen to what your co-worker has to say and let him or her know that you really do understand the message. Thoughtfully listen before responding.

And share success. If the team members know that their joint successes will be reflected back on them as individuals and as a unit, there is a much greater likelihood everyone’s effort will be channeled in a team-oriented manner.

Of course, these are just general nostrums, the details of which can be filled out in many different ways. And don’t forget good old common sense. For most of us, our instinctive reaction on how to work with people is most often right on the mark.

And, finally, create an environment in which it is fun to work. We spend too many hours of our waking day at work not to enjoy it.

Barry Cullen
Executive Director
National Arborist Association

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By Donald F. Blair
If you’re going to take the time to rig a Crossline Speedline, it is extremely important to understand the dynamics and physics of the process. Here’s what you need to know.

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Rigging

...the Crossline

Photos by Donald F. Blair
Of all the arborist skills, rigging and removal has been such a hot topic for the last 15 years that at times the interest has almost seemed faddish. I think that part of that interest has been rooted in the fact that techniques and equipment for rigging and removal didn’t change much for the first 100 years of commercial arboriculture. And then came Ed Hobbs with the Bry-Dan saddle, Hobbs Blocks, Hobbs Lowering Device and advanced techniques to go with them.

As the years have progressed, equipment and techniques have been further refined. Working through the M.F. Blair Institute of Arboriculture, I’ve worked hard with Ed Hobbs, Sam Noonan, Robert Phillips, Ken Johnson and many others throughout the world of arboriculture to develop, proof test and refine the concept of a Systems Approach to Rigging for Removal.

By breaking the process of removal down into a series of tasks, we have developed guidelines for the selection and application of techniques and equipment to tackle virtually any rigging challenge, no matter how simple or complicated.

In the “Circus of Removal,” the Speedline is the aerial attraction and by far the most popular act at the demonstrations we have conducted from Sydney, Australia to Kew Gardens, England. As much as a crowd-pleaser the Speedline has been, the funny thing is:

A. You probably won’t need to use it very often.

B. Those who have used it a little have probably been frustrated by some problems they may have had in getting it to work for them.

With these observations in mind, it is extremely important to understand the dynamics and physics of the Speedline. If you’re going to take the time to rig one, you might as well get it right.
Defining the Speedline

A Speedline is an arborist's version of high-lead logging. Search and Rescue types might recognize some elements of the Speedline in a Tyrolean Traverse or other gear or personnel transport systems.

The Speedline has evolved as a method for moving brush or limbs from the tree to a staging area. When rigged properly under appropriate conditions, the Speedline can save a lot of time in dragging brush. It can also prevent damage to understory plants and structures. I have heard the terms "zipline" and "slideline" applied to what I recognize as a Speedline. To keep things simple, I will refer to it as a Speedline throughout this article.

Evolution of the Speedline

In the beginning, the Speedline was a pretty simple affair using a tensioned line, angling from the tree to the crash zone. Arborists would clip a lanyard around the branch to be cut and let 'er rip. The brakes were applied by slacking the line. Simple, effective and potentially messy. The "divot factor" increased with the weight and velocity of the projectile. The number of pieces that could be cut before "reloading" were limited by the number of slings that the climber took up with him.

This most basic rig is known as a "Simple Direct" Speedline. Think of the Simple Direct Speedline as the snow to boggan of rigging. Yes, you could move brush with it, but about all you got was a seat onboard without steering control or brakes.

The next step in evolution was to create a more effective system for descent control than crash landing each piece. The addition of a "traveling block" and a haulback line to the Speedline provided the needed brakes and steering control. With the basic traveling block in operation, the Speedline had arrived at the "Model T" stage of evolution.

We now had enough concept and technology available to learn what the problems and limitations of the Speedline were. At this point, Ken Johnson, an arborist, inventor, engineer and designer, set about improving on the concept. Johnson is the inventor and patent holder of the Rope Brake and the Arbor Cart. In a joint venture with Sierra Moreno Mercantile Company, he has greatly improved the Hobbs Lowering Device.

Owning a tree service based in the San Francisco Bay Area, Johnson has spent years dealing with the removal of extremely challenging eucalyptus, redwood and oak trees. Never one to be satisfied with the ordinary, he made a name for himself a few years back as a professional coastal redwood timber faller.

He liked the idea of the Speedline, but was frequently frustrated by the problems that he encountered when pushing conventional Speedline rigging to the outer edges of practical application. The problems that he identified were:

1. **Single anchor point**
   Large trees frequently have a huge amount of brush. You can end up with a "parking" problem
if you try to send all of that brush to one place. Limiting your Speedline to a single anchor point can also become a major problem if there isn't a single anchor point available where you need one.

2. Traveling Block and Haulback Line

He didn’t need to have too many loads hung-up before he realized that there are some cardinal rules that must be observed in setting up a successful rig. The traveling block must run freely on the Speedline without binding at any angle of inclination or pull. Many pulleys may ride the speedline down, under load, well enough, but will cause the cheekplates to pinch the Speedline so severely on the back haul that it will not run up the rope.

The haulback must pull in line with the anchor point in the tree. An inadvertent side pull can create such a bind on the back haul that, once again, the pulley will not run back up the line to the climber. These simple rules had been worked out early in the evolution of the Speedline.

Johnson added his own, very special perspective. A few years ago, I accompanied Johnson and Derek Zatcovich on one of their standard extreme tree removals. They had a 200 foot Douglas fir to take down. Most of the brush was going to ride down on a Speedline. Pretty standard, but I asked why 1-inch shackles were being piled onto what I'd always used as a standard traveling block under more conventional conditions. Ballast was the reasoned answer. When setting a Speedline that long, there had to be enough ballast on the traveling block to overcome the weight of the haulback line. The longer the run, the heavier the line, hence the greater the need for counterweight. The ballast is also helpful in keeping the traveling block from bouncing on the line. When that happens, the haulback line is frequently flipped over the Speedline, causing a twist in the rigging that just doesn’t work.

3. Tension Control

We’ve used trucks, come-alongs and Eucmen to tighten the Speedline, but there is frequently the need to take up more slack than is humanly possible, and you are not always attached to a truck or winch. Johnson encountered problems with tension control, and we eventually developed an elegant solution using a high-tech version of a
classic block and tackle.

With a brief overview of the history of the concept of the Speedline and some of the problems and solutions encountered, it is now my pleasure to introduce you to the Crossline Speedline.

The Crossline Speedline

Being part science, skill and intuition, many arborist tasks are not terribly demanding of specific equipment. A climber can choose from 3-strand, 12-strand or 16-strand lifeline and get the job done safely. Tree limbs don’t care much if they are roped down with 3-strand, single braid or double braid.

When it comes to the Crossline Speedline, I am quite specific about the equipment that we use because it makes a difference!

The choices for some components of the system are wide open. The only real criteria for the Crossline anchor slings are length and strength. Whereas the specific choice of haulback line is not critical, the Speedline rope is, as I will explain later. In many of our demonstrations and lectures, we try to encourage creative thinking and flexibility by stressing that the way we rig this block or use that sling is not the only way that the end result can be accomplished. I am going to abandon that philosophy in this discussion because through trial and error over two decades, we adopted this system because it’s as simple as possible and flexible in field application.

The components of the system have great value as components in other rigging systems. Sure, you can substitute prusik loops for the Gibbs ascenders, but why would you want to? A screwdriver is a lot cheaper than a cordless electric drill, but how many professional carpenters do you see relying upon a screwdriver these days because it will do the job and costs less to purchase? The cost of equipment should never be your first or primary concern; its suitability to its task, service life and your need for the item should be your main concerns.

It doesn’t matter how much you pay for a tool if you never use it. A cheap tool you use constantly will cost you plenty if you have to replace it over and over.

Zones

Because there is a considerable amount of rigging spread out over a wide area in setting up a Crossline Speedline, we find it helpful to break the system down into three zones:
1. Top
2. Center
3. Anchors

1. Top (fig. 1)

This detail shows the Speedline (white rope) tied off to the stem of the tree with a clove hitch and half hitch. The tail was left long enough to secure the guideblock with a bowline. The guideblock is necessary to keep the haulback line in alignment with the Speedline.

The illustration also shows how the shackles are set on the traveling block so that the haulback line pulls with the sheave and not against it.

Fig. 2

The haulback line runs down the tree trunk to the ground where it is belayed by wraps or a tree-mounted friction device.

2. Center (fig. 3)

The figure eight is set into the Crossline (rope at bottom of picture)
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and the ends are anchored. The guideblock leads the Speedline to the Munter Hitch (fig. 4) set onto the crossline a comfortable working distance from the center. The 4:1 block is anchored to the figure eight and attached to the Speedline via Gibbs Ascender. Note how the rigging is designed to keep all lines parallel without tangle. The 4:1 blocks are used to pull slack out of the Speedline that is taken up through the Munter Hitch on the crossline.

Two important tips:

A. As you are tailing the slack in the Speedline through the Munter Hitch, be sure to reverse direction on the hitch before you place the line under load (fig. 4). Remember that the Munter rotates in the carabiner as it adjusts to either a taking in or letting out direction of pull. It is “taking in” when you’re pulling slack. If you don’t let out just enough slack to rotate the Munter into the “letting out” attitude, you may find it locked under load and you won’t be able to break it loose.

B. Slack the fiddleblocks after you’ve secured the Speedline to the Munter hitch and before you place the system under load.

The blocks are not designed nor intended to bear the shock load of dropping limbs into the system.

The Big Picture

The overview shows the Crossline Speedline fully assembled. A delta link (fig. 8) is specifically designed for the three-way loading that occurs in this type of rigging. The Crossline was tied off at this end through a Munter Hitch to make it easier to get the initial tension of the Crossline set. The rope bags help keep excess rope under control.

Final Thoughts

The Speedline has been as infuriating as it has been fun to implement over the past two decades. At this point, I’m satisfied that we have a system worked out that offers practical solutions to the problems that we have encountered over the years in the real world. If this is the current word, it certainly isn’t the last word, because we will continue to seek input as to
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how to further refine and improve our techniques. That is called progress. That is professional. Space and time being what they are, this article didn’t get the opportunity to explain how the addition of a Rope Brake or Lowering Device can double the versatility of this system. We’ll save that for another article.

Note From the National Arborist Association: Donald F. Blair, Ken Johnson and Robert Phillips are working with the NAA to develop an arborist skills training program on Rigging for Removal. Advanced techniques such as the Crossline Speedline will be explained in detail through a manual, video instruction and field demonstrations. Further details will be made available as plans for the program progress.

Don Blair is the sole proprietor of the Sierra Moreno Mercantile Company, an arborist equipment, research and development firm.

Getting Started

You’ll need some gear for the Crossline Speedline.

Rope:
Rope is unemployed cordage. It becomes a line once it is given a specific task.

Red Rope Bag: Haulback line.
This rope is attached to the traveling block and provides the brakes and steering control to the load being managed.

The haulback line must be long enough to go from the ground to the guide-block in the tree and back down the Speedline to the drop zone. This can often require a rope that is 240 feet long or longer. Although any rope will serve this function, we would recommend rope specifically designed for arborist use.

Yellow Rope Bag: Crossline. Again, the specific rope selected is not too important, but we have found that single braids are a little easier to work with than coated double braids. In keeping with Blair’s Weak Link Rule, always remember to make sure that the weakest link in this or any rigging system is the load line and not the anchors or supporting hardware.

Orange Rope Bag: Speedline.
This line needs to be an Arborist Grade, single-braid, 12-strand line. The critical factor here is the use of the Münter Hitch
in controlling the tension. Coated, double-braided lines simply will not feed smoothly through the HMS carabiner and that’s that. You could use a 16-strand, but they cost more and aren’t quite as nice to work with as the 12-strands are in this specific application.

We use 16-strand on the haul-back. Again, a standard 150-foot cut length is not often long enough for a serious Crossline Speedline. We use 240-foot lines. Bagged as they are, they are easy to store and we only draw on what we need. Nothing can neutralize a Speedline faster than having to tie two lines together.

**Slings:**

The endless slings and the Deadeye sling pictured represent the use of slings for anchors for the Crossline or a sling from the traveling block to the load. The length and rating of the slings selected must be appropriate to the loading. Web slings in either endless or eye-eye configurations will work suitably in these applications. Not pictured but highly popular as anchoring slings are the adjustable Whooppee slings.

**Blocks:**

We have settled on the use of three CMI 5/8-inch stainless steel rescue pulleys with 2-1/2-inch sheaves. In my opinion there are no practical substitutes. Although other pulleys have proven that they will work on the traveling block, this specific pulley has proven itself as the most practical combination of form, function and price. Other pulleys could serve as the guide blocks, but by standardizing on the one pulley for all three functions, you never have to worry about which pulley goes where! We strongly recommend the use of stainless-steel rescue pulleys for most of our rigging systems. They are stronger and more durable than their lighter-weight and less-expensive aluminum counterparts. The aluminum blocks aren’t that much lighter or so much cheaper that they make a significant difference in the long run.

**Figure Eight:**

The figure eight makes an elegant rigging point when set into the Crossline with a double pass hitch. You may use either a steel or an aluminum figure eight here, but it must be a rescue-type with ears. A 3/4-inch rope capacity and two rigging holes are features that are so desirable that we consider them to be a necessity.

**Gibbs Ascenders:**

We need purchase points along the Crossline and the Speedline to anchor our block and tackle and our HMS carabiner. The stainless-steel Gibbs ascenders accomplish this task as if they were designed for this sole function. We recommend the 3/4-inch size and never consider anything but the stainless-steel model by virtue of its strength and durability.

**Block and Tackle:**

Use of this block and tackle was the missing link that really pulled the Crossline Speedline together as a viable system. We turned to the sailing industry for inspiration in the selection of a suitable block-and-tackle system. We finally settled on 4:1 ratio fiddleblocks with a cam that holds the line under tension. A 4:1 ratio means that 100 pounds of muscle are converted into 400 pounds pull. Without the cam to hold your gains firmly, you’ll end up playing a losing game of tug-of-war with yourself.

**Links:**

We use a mix of shackle, carabiner and M-R screw link to make the connections. As a rule, we advocate the use of screw links for static connections, meaning those that don’t have to be opened and closed frequently. In lieu of Ken Johnson’s Rigging Plate™ we use screw pin anchor shackles on the traveling block in order to gain enough ballast to make the system run smoothly.

As much as I like steel links for most rigging, aluminum HMS-style carabiners are necessary for the Munter Hitch, so we use several of them in the same spirit of interchangeability that we applied to our selection of blocks.
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Within this guide are methods for determining values, along with suggestions of various types to help guide you through the process. Some are more challenging than others.

One example that could present difficulty would be a trunk with major branches below 4.5 feet. Measurement should be at the smallest circumference below the lowest branch or average the sum of the branch areas and the smallest trunk area below the lowest branch.

Another example might be a multi-stem tree. Add the area of each stem measured 4.5 feet above the ground, use the Replacement Cost Method or use the sum of trunk areas if each contributes proportionately to the tree crown. Adjust for a stem that does not contribute proportionately.

For example: one stem (5 inches in diameter, 20 square inches in area) of a four-stem tree, although 40 percent of the stem area, only contributes about 30 percent of the crown volume. Therefore, the five-inch stem area should be reduced to 75 percent or 15 square inches.

It should be remembered that The Guide is only a guide and your professional judgement is necessary to obtain qualified results. Read the entire Guide if you are to gain its full benefit. Revised periodically by the Council of Tree and Landscape Appraisers to keep it current with tree appraisal across the country, it is published by the International Society of Arboriculture.

Ellis Allen is NAA representative to CTLA.
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November's web site of the month is Rayco Manufacturing, Inc. Established in 1978, Rayco is one of the leading manufacturers of stump grinders in the country. Based in Wooster, Ohio, the company's manufacturing and parts facility spreads over 110,000 square-feet.

The web site offers in-depth information and specifications on all their products. Specification data covers engines, drive systems, cutting capacity and a wide variety of general information. If you want more information about a product, an e-mail reply can be requested answering customer concerns. Location of the nearest parts and service department in a particular area can also given out via e-mail.

The home page has links to pages such as Company Background, Walk Behind, Hydraulic, Land Clearing, Super Tooth and Hydra Tug.

"The web site gives a chance to arborists who are working during the day to ask technical questions during non-business hours. This helps us to address the customer in a better way and leave no unanswered questions about our products," says Jake Stout, national sales manager for Rayco.

This is a well-designed site that provides ample information on stump grinders and related items. All products are described in great detail, and each page has an image of the product, which gives surfers a better idea of the size and scope of the machinery. A user-friendly web site, Rayco's address holds a lot of promise for the future.

http://www.raycomfg.com

continued on page 22
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ArborTie is a new material for staking and guying trees. Designed to replace traditional methods such as wire and hose, the polypropylene materials have weave that ensures a rounded edge. This prevents the material from cutting into the bark of the tree, which is a common cause of injury or death to young trees. The 900-pound test strength stands up to fierce winds while providing enough sway to help the tree develop trunk strength. ArborTie fastens to any stake or anchoring system with traditional knots or staples. For guying, it eliminates the need to flag or cover guywires and the ArborKnot expands as the tree grows in caliper, preventing girdling. For more information, contact: Deep Root Partners, L.P., 345 Lorton Avenue, Suite 103, Burlingame, CA 94010. Phone: 415-344-1461 or 800-ILV ROOT (458-7668); Fax: 800-277-7668.

TimberKing, Inc. announces its new Talon 900 Conveyor-Feed Edger. It uses industrial-duty rubber conveyor belts to hold work-piece securely on the infeed and outfeed, providing grade-lumber accuracy in edging and gang-sawing. The conveyors feature a variable feed rate of 40 to 60 feet per minute. Diesel, electric, and 80 FPM feed speed are also available. The Talon 900 will cut pieces 21 inches wide by 3 inches thick. It comes standard with two 12-inch carbide blades—one fixed and one moveable. It fits into the bed of a full sized pick-up, making it a perfect compliment to a portable sawmill operation. For more information, contact TimberKing, Inc., Department 9-88, 1431 North Topping Avenue, Kansas City, MO 64120. Phone: 800-942-4406, ext. 9-88.

The Olympyk 962 is the latest introduction in a new line of reengineered saws for the professional market. Featuring a high power-to-weight ratio, the 61.5cc (3.75 cu.in.) saw develops 4.7 DIN hp, from a powerhead weight of 12.1 pounds. Other features include a gear-driven aluminum body, adjustable oiler, large surface area air filter and an inertia chain brake. Standard chain is .325 pitch; 3/8 inch is available as an option. Olympyk offers a complete model line of commercial-duty saws, from 35cc-101cc, as well as a full-range of trimmers, brushcutters and clearing saws. For more information, contact Olympyk Importer Tilton Equipment Company at 800-447-1152 or write to: Olympyk, Dept. RPM, PO Box 68, Rye, NH 03870-0056.

Building on the success of the original Greenteeth, Green Manufacturing, Inc. presents a new larger pocket suited for 35 hp and larger machines. The new pocket design has an increased, more aggressive bend (45 degrees) and rounded corners for mounting ease. The new pockets are drilled to accommodate any wheel set-up and use standard Greenteeth. Contact Green Manufacturing at 313-753-5200 for further information.

Designed for intensive nursery work, the new Series P160 bypass loppers from Sandvik Saws And Tools reduce cutting effort significantly. Field and laboratory tests show the new tool requires about 10 percent less force to cut a 1-inch branch compared with conventional loppers. The P160 loppers are carefully balanced to make them more comfortable to use at chest height or overhead. Maximum cutting capacity is 1.75 inches. They have a pivot bolt offset from the centerline and a forged steel counterblade to hold the branch steady and minimize bark damage. They also have a deep hook that traps large, slippery branches as well as thin twigs. For more information, contact Sandvik Saw Tools Company, Box 2036, Scranton, PA 18501-2036. Phone: 800-826-9893; Fax: 800-877-5687.
The combination of low-kickback performance and superior cutting capability can now be found right out of the box in a new cutting chain from the Oregon Cutting Systems Division of Blount, Inc. The Vanguard 72L series is a 3/8-inch-pitch chain that gives professional users the full margin of safety called for by the ANSI chain saw safety standards for low-kickback chain, while delivering cutting speed, efficiency and high-production capability. Maintenance and sharpening are essentially the same on this chain as on its predecessors, the 72LP and 72LG. But three of the most common chain-maintenance tasks must be performed with the distinctive features of the 72L in mind. Detailed help and instructions are included or can be obtained directly from Oregon. For more information, contact: Blount, Inc., Oregon Cutting Systems Division at 503-653-4629.

Daloz Safety, formerly Willson Safety, has expanded its line of personal protection equipment. Prevail eyewear offers integrated side-impact protection, peripheral optics and clear, comfortable vision. It also meets the ANSI Z87.1-1989 performance standard without side shields and CSA Z94.3-1992 certification for high-impact with side shields. The high-performance Willson brand lenses utilize PrismPerfect lens technology, which reduces distortion and eye fatigue. These polycarbonate lenses also absorb eye damaging wavelengths of UV. Part of the Willson WorkSite Collection of protective eyewear that meet a variety of safety and style demands, Prevail models are available with a variety of lens options. Daloz Safety offers a full line of Willson eye protection products for the workplace including designer safety eyewear; spectacles; impact and splash goggles; face shields. For more information, contact: Elizabeth A. Antry, Marketing Communications Manager. Phone: 800-345-4112; Fax: 610-371-7874.

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Legendary radio voice and commentator Paul Harvey recently received Radio Mercury Awards' first-ever Lifetime Achievement award to a personality. With more than 21 million listeners nationwide, Harvey is well-known for his intriguing anecdotal news reporting. Husqvarna Forest & Garden Co. has been a proud sponsor of his news program since 1995.

"To Husqvarna, Harvey represents integrity within the broadcasting world," said Husqvarna President David Zerfoss. "We’re proud to partner with someone who exhibits a value that also is at the core of Husqvarna’s values."

New President

Gerard T. Donnelly, executive director of The Morton Arboretum, is the new president of the American Association of Botanical Gardens and Arboreta (AABGA), a 2,000-member, national organization representing more than 420 North American public gardens.

Donnelly plans to lead the AABGA through the next phase of Agenda 2000—the association’s strategic plan and goals for the new millennium. The plan includes creating programs to raise public awareness about the importance of gardens and plants in everyday life; expanding education collaborations among gardens and arboreta; increasing plant conservation practices; and enhancing member services.

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In order to maintain quality and efficiency, The F.A. Bartlett Tree Expert Company conducts a week-long training session for working foremen at its Tree Research Laboratories in Charlotte, N.C.

Attended by foremen from across the United States and Canada, the class consisted of both classroom and field sessions on tree biology, pruning, climbing, rigging, cabling and bracing, lightning protection, hazardous tree detection and evaluation, fertilization and pest management.

In addition to technical tree care, there were sessions on equipment maintenance and a strong emphasis on new products and techniques used in all aspects of arboriculture.

Pictured here from the August seminar are: Brad Evans, Kevin Shrewsbury, Art Price, Robert Lamond, Ryan Strother, Charles Rayfield, Daniel Harrison, Dave Anderson, Al Salas, Bob Oliver, Charles White, Keith Klefstad, Darren Gray, Richard Herfurth, Doug Evanuska, Laurie Williams, Daniel Gennaro, John Alberts, Richard Smith, Pat Flynn and Joe Bones.

Callbacks

In the article “Controlling Construction Damage to Trees,” which appeared in the September issue of TCI, Al Olson’s name was spelled incorrectly. We regret the error.
When it comes to insurance, CNA looks at businesses from all perspectives. In fact, CNA has been designing customized programs for more than 25 years. We even have one that's pruned to the exact needs of the tree care industry. It's more than basic property protection; it offers coverages for underground storage tank pollution, transportation of designated pollutants, other limited pollution and pesticide/herbicide applicator.

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Don't Forget ...

I recently received a copy of an article in TCI which chronicled the relocation of five oak trees from the Hot Springs, Arkansas Convention Center site.

Relocating the trees was a thrilling experience for me. Having seen 126-year-old oak trees that had been relocated in Biloxi, Mississippi, I had no doubts the Save The Tree Committee would succeed in saving our trees.

I did notice that an important group was omitted from the list of those who assisted in the removal and relocation of the trees. The Arkansas Forestry Commission provided a $10,000 grant which enabled the hiring of a professional arborist and tree engineering consultant and the funding of a public educational program about tree removal and, in the process, how to avoid situations where old, valuable trees are lost.

Arkansas Forestry Commission personnel assisted in site evaluation, tree removal, tree relocation and continue to advise on the care of the trees at Transportation Plaza—their new home. A rain forest irrigation system donated by local businesses has been installed.

Julie Dickson
Program Director
Hot Springs/Garland County
Beautification Commission

Putting TCI to Use

Congratulations on producing another superior issue of TCI. The September issue was especially interesting to me, especially Bob Rouse’s “Planning to Save Trees Before and During Construction” and Sunita Khosla’s “When Turf Meets Trees.”

At present, I am a consultant to the Illinois Department of Military Affairs, and just completed working on the first year of a three-year tree inspection project.

Most of the Illinois National Guard Armory grounds are treeless. Those that do support (barely) an urban forest are aptly described in Khosla’s article: Turf is king! Several Armories are being rebuilt or relocated, so Rouse’s observations shall be of use as I advise the construction engineers.

John W. Andresen
Emeritus Professor of Urban Forestry
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Uncorrected Visions By Neal Desch & Jeff White

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TREES CARE INDUSTRY - NOVEMBER 1997
Touching Trees

with Dr. Alex Shigo

By Robert Rouse

Arborists Frances Reidy, Chris Roddick, and Ralph Padilla (l-r) get a first-hand look at included bark, on the inside.
The time: early one Saturday morning in September. The place: Paul Smith’s, a tiny hamlet nestled in the wilds of the Adirondack Mountains of upstate New York. The purpose: an autopsy. An autopsy! Has there been a crime? Perhaps. Has a death occurred under mysterious circumstances? Maybe. But not to worry, this is not your typical autopsy, or typical crime for that matter. Although our doctor is a world-famous forensic pathologist, his discipline is not human pathology, it’s plant pathology. His field of special expertise is not human anatomy, it’s tree anatomy. Of course, that works out just fine since our victim is a tree!

At Paul Smith’s College, the College of the Adirondacks, Dr. Alex Shigo presented a workshop on hazard trees and the decay process. True to Shigo’s teachings, all the attendees of the workshop were encouraged to touch trees. Shigo has a very strong opinion about the importance of touching trees. Expressing this opinion, he passionately pleads, “I would like to see a general Shigo Rule: By law, anyone who has not touched the inside of a tree should not be allowed to give an expert opinion about a tree’s health.”

After being given some lessons in basic tree anatomy and chemistry, we were ready for our first autopsy! Shigo carefully directed the college’s staff on how and where to make the cuts. Axial cuts were made every few inches and the pieces were laid out and numbered. This created a progression of tree cross-sections that gave the attendees an easy view of how cracks, wounds and tree defense barriers changed at different locations on the trunk. This is the type of cut arborists make every day, but how often—due to our busy schedules—do we forget to look at the inside of the tree and the story it can tell.

“By counting rings,” Shigo shows the class that, “the basic wounding period of the tree was when it was five years old.” He hypothesizes that this may have been the time of transplanting. Based on a sudden size change in annual growth rings and the presence of compartmentalization walls to stop internal decay, he goes further, stating his belief that a decay fungus gained entrance through the roots cut during the transplanting process.

After reconstructing the life history of the tree, the attention of the attendees is turned to the apparent relationship of cracks to decayed wood. Shigo explains, “Where the tree was wounded, often you will see, off to the sides, cracks. As the tree moves, it sways, and you get cracks.”

“This is a mechanical fracture, starting from the inside. The only way the tree can deal with this is that it sends out some friendly fungi and bacteria to occupy the crack and add some chemicals to slow down the decay process. Some people are interpreting these cracks as coming second. They are saying that the fungus goes out and the crack follows. No! It’s the other way around, it’s a mechanical thing, and then the fungi follow the crack.”

Shigo quickly turns the attention of
Tree Autopsy

Tree vitality

The patient had some structural problems before it was cut down. In the past there were some wounds or stresses, allowing decay organisms a foothold. Some cracks followed, but was the tree healthy overall? If it did not threaten to crush a target, could it have survived for a reasonable amount of time despite its structural defects? Was it really necessary to remove it? Our next move was to try answering the troubling questions most arborists ask. We had to check the vitality of the patient.

One method arborists can use to determine the vitality of a standing tree is IKI staining. On our freshly cut autopsy tree, the IKI or iodine staining could be performed so all the eager attendees could easily view the process. On a standing tree, a small core sample combined with a basic understanding of chemistry and tree anatomy is all that is needed.

Shigo asserts, “You can, from select trees, take a small core and determine the vitality of the tree.” Shigo explains this is so because, “You will only have stored starch in living cells.”

As he stains a portion of the wood with iodine, he explains to the students how IKI stains black for pure starch. As the starch level falls, the stain color progresses from black to purple, violet, yellow, and finally—when no starch is present, there will be no stain at all.

Shigo directs the attendee’s attention back to the example and points out that, “in a sense, the purple sneaks down into the (deeper) tissue, then you see a yellow zone, then you see nothing. From here where you see the yellow all the way out (to the bark), that is called the symplast. The symplast is a three-dimensional connection of the protoplasm in a tree. This test will tell you where it is, how much is in it, and where it seeps down in.” The depth of the symplast, indicated by starch storage, is what determines the vitality of a tree.

Shigo recommends establishing seasonal baseline* for the ten most common trees in your area. You can compile these baselines by performing staining tests on healthy trees slated for removal or when removing a limb. Record the results by season. Baselines for each season are necessary because the trees store varying amounts of starch at different times of the year. These baselines will give you guidelines to help judge if the suspect tree is healthy.

As always, Shigo seizes the opportunity to further his student’s knowledge of tree anatomy by pointing out that, “You will also see, if you look very carefully, that the cambial zone does not stain purple.”
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He notes that the cambial zone does not store starch, therefore no purple staining.

Using an example all people understand, he continues, “It’s just as the queen bee does not go out looking for food, you bring it to her. The queen bee has one major job—produce eggs.”

Connecting the example back to the cambial zone, he asserts, “The cambial zone has one major job—produce fusiform ray initial cells.”

Decay organisms

But how does a tree’s physiological state help prevent or delay decay organisms? Shigo explains that an important factor determining how a tree will react to decay organisms is the amount of moisture contained in a representative sapwood cell, often measured in relation to the fiber-saturation point of the cell.

Decay fungi are primarily aerobes. They require oxygen to live. Many bacteria, however, are anaerobic, which means they do not require oxygen to live. These bacteria may be friendly to the tree, providing a degree of protection from decay fungi.

Shigo explains what this means to the tree and the decay organisms. “Bacteria can come in when you have a high amount of water, then you have wetwood. So you either go from case hardening, which is a protection wood on the lean side of fiber-saturation point (having very low moisture), or you can have wetwood, which is a high amount of water on the other side of fiber-saturation point. Believe me, it’s tough to be a decay organism because they have very narrow bands and margins where they can operate. This is why I believe in and I worked so hard on the concept of succession.”

Many of us are familiar with the concepts of old-field forest succession or forest-fire succession. Succession is the method nature uses to reforest an area that has been cleared for one reason or another. For instance, a farmer abandons a field. Soon small shrubs and trees move in to colonize the field. Years later these pioneer species are eventually overgrown by another group of tree species that grow taller or are better adapted for long-term survival. The first group of species, the pioneers, slowly dies off and is succeeded by the second group. Although the number of species involved and number of successions that can take place over time vary by region, the general concept is the same. Another key feature is that the early, pioneer species are providing something that the late successional species need to survive. Perhaps it’s just a little shade for the new seedlings, or leaf litter to act as mulch. Perhaps they provide an environment that is conducive to the formation of mycorrhizae that the late succession
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species need to thrive. This type of succession also occurs when decay organisms are trying to turn your client’s tree into dinner.

“One way you could gain entrance and move into a tree is to get a group together,” notes Shigo. In general terms, he believes that some species of decay organisms act as pioneers, similar to the first tree species that colonize an abandoned field or burnt forest. After wounding occurs, decay organism pioneers colonize the wound, causing the tree to react. The tree fights the decay organisms by secreting a protective shield of chemicals on the exposed area. The first group is killed off, but there is another group waiting! This second group of decay organisms uses the tree’s protective chemicals as food. Once these chemicals are removed, a third group of decay organisms will take over, since they can now survive on the wound.

Shigo makes an important point about this process. “The good part about this is that it takes time. The tree forms a boundary. And while the time clock is going by, the tree can put new rings in new positions.”

The sawmill

Later that day (after many lessons, discussions and observations), the attendees were ready for another autopsy. This time, however, we would move beyond crude autopsy tools such as chain saws! Shigo arranged for a number of diseased trees to be cut radially, through the center, so the attendees could get a better visual perception of how compartmentalization of decay proceeds over time. This type of vertical cut exposes the boundary zones throughout the column of the trunk. This made it much easier for the attendees to visualize the boundary zones a tree forms over time whenever it has to defend itself against decay organisms. The Forestry Department at Paul Smith’s College provided the radial cuts at their student sawmill, a luxury most colleges cannot offer.

Shigo provided the expertise to be certain the tree was cut just right, yielding the best view possible of the internal decay process.

When the cut logs were brought out of the saw mill, the tree’s boundary zones confining the decay to a central cylinder were apparent. Not only that,
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but each successive boundary zone the tree laid down as another injury occurred could easily be seen. Analyzing the life history of this tree, Shigo noted that, “You see, you have major boundaries, over major boundaries, over major boundaries.”

He points to the boundary zone closest to the bark and notes, “The last major wounding period in the life of this tree was right over here.”

The sawmill crew cut a number of trees radially to give Shigo plenty of tree defects to discuss. Earlier in the day he had pointed out that many ram’s horns, an inward curling of wound wood, are caused by the rapid growth of wound wood. The rapid growth is initiated after a flush cut is made. He had his opportunity to demonstrate the problems ram’s horn can create when the sawmill crew cut a tree with a flush cut. The radial cut of the sawmill revealed the boundary zones created by the tree to wall off the decay organisms that attacked the wound.

Shigo was quick to observe, “another reason why we have this break out of a decay organism is we had a ram’s horn that not only went vertically, it went horizontally. And the ram’s horn cracked the tree out ... in an axial direction.”

Many other topics were discussed over the course of the weekend. Shigo explained his “simplified” method of hazard tree rating, the use of a Shigometer, identification of hazard trees as they stand, and even related visual signs of tree hazards to the anatomical defects that accompany them on the inside of the tree.

Also, of great benefit of the seminar was being able to take a time out from one’s busy schedule to reflect: To think about just what you are doing every time you prune, drill, inject, or core a tree; to think about how the living organism you are treating will respond; and, to think about what is happening on the inside of a tree as a result of the wound, crack or cavity you see on the outside of the tree.

Robert Rouse is staff arborist with the National Arborist Association.
Winter Management Conference Preview!
The author will present an in-depth seminar on "How to Interview Successfully" in New Orleans on Nov. 5.

How to Interview Winners

By Susan A. Friedmann

Have you ever had an employee accept a position with another tree care company at the busiest time of the year, leaving you high and dry to pick up the pieces and continue “business as usual.” It happens all the time. Is this recurring nightmare happening to you?

The success of any organization is its people. Hiring and keeping good employees is a challenge almost all tree care companies face. While there’s no foolproof system for selecting people, there are several techniques for identifying “winning” employees who are more likely to stay with your business.

In his “Selecting Winners Workshop,” Barry Shamis of Redmond, Wash., outlines the following six-step procedure:

Step One: Developing a profile

Before you can make any kind of hiring decisions, you need to develop a precise profile of the ideal candidate. This profile needs to be broken down into two parts—what you expect the person to do and the skills, qualities or characteristics needed to achieve those requirements. For example, as well as having good sales skills, a manager needs to be well-organized, self-directed and have good people skills.

To avoid the “I’ll know it when I see it” syndrome, this profile should be written down clearly and concisely. List all the desired expectations, qualities and characteristics of an ideal candidate.

Step Two: Recruiting

This step may be the toughest in the whole selection process. There is a shortage of qualified arborists today and there are even fewer with true expertise in the industry. As a result, innovative approaches are necessary to generate a qualified candidate pool.

Today, you need to be both creative and proactive.

Start by determining where the people you want to attract are and what they are doing. Think about searching for candidates where other organizations are not looking. If you want to place an ad, consider specific technical or professional publications.

Even with all that searching, your best source of candidates is still likely to be readily accessible “internal” and “external” resources—employees, customers, suppliers, industry...
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can be extremely disconcerting and stressful. It can also lead to hiring based on desperation and immediate need, rather than recruiting the “right” person who will be a good fit in your company.

Step Three: Screening
By the time you get to this stage you have a pile of resumes to study. When screening a resume, remember to look for trends and patterns of accomplishment. Look for results and behavior that you think will be effective in the position you are looking to fill.

However, cover letters and resumes alone are not enough. Telephone interviews are a critical tool in the selection process. Barry Shams’ cardinal rule is “never meet anyone face-to-face until you have spoken to them on the phone.” This will avoid wasting time in interviews in which you realize after the first two minutes that the person is not suited for the position.

The phone screen should be conducted as a mini interview. Seek more information about one particular period in the applicant’s life. Ask about a critical requirement of the position. The real purpose of the phone interview is to get away from the “gut feeling” and base hiring on measurable information.

Step Four: Information gathering
Most of the information needed to make the best decision will come from a face-to-face interview. However, the effectiveness of that interview is totally dependent on the types and quality of questions that you ask the applicant.

According to Shams:
1. Questions should be focused and direct.
2. Questions should have only one answer. For example, “What was your biggest challenge last year as a manager?” is a better question than “What are your biggest challenges as a manager?”
3. Questions should have a specific planned purpose. For each question you ask, make sure you know what specific piece of information you are looking for.
4. All questions should be job-related. This will help prevent issues which may be taboo.

Step Five:
Verifying information
In this stage of the process, it is crucial to verify information on your most promising candidates. Seek references from people who can tell you about the quality and quantity of an applicant’s work. Since getting references these days is often tricky, put the burden on the candidate. Have them suggest people who can and will talk to you. Don’t make it your problem!

Avoid asking for opinions or judgments. Ask specific, quantifiable questions about your candidate’s abilities. For example, “How many people did she manage? How did she train her people?” If your candidate has a degree, you may also want to verify details with the university.

Step Six:
Evaluating information
This is the time to take all the data you have on your serious candidates and make a qualified evaluation.

To do this objectively, you need to create a simple matrix. Along one axis list all the requirements from your profile: the knowledge, skills and abilities needed for the position. Along the other axis list all the candidates. Then evaluate each candidate against the requirements.

Finally, make sure you substantiate your evaluation with the information gathered in the interview. Do a “gut check” to ensure that your evaluation is not based on biased feelings. The fact that someone is “nice” may be a plus but is generally not a good enough reason to hire him. Hire people because you believe they are capable of being successful on the job. And remember: Successful people are not born... they’re trained.

Susan A. Friedmann will be a featured speaker at the National Arborist Association’s Winter Management Conference, held next in New Orleans from February 10-15, 1998. She will teach seminar attendees the techniques necessary to select winning employees. For more information on all of the events and activities at Winter Management Conference, contact the NAA at 800-733-2622.
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Personal Financial Planning

Where you end up in life depends on when you start the race

By Bill Wilde

As a financial planner, my goal is to help people accumulate wealth so at some point they can become financially independent. Unfortunately, the majority of people in the United States are not going to be able to retire to the style that they would like. In fact, only two out of 100 will retire financially independent. How can you be one of those two?

One of the ways is to have your money work for you. The second way is to have other people work for you. If you are to reach your retirement goals, you must accumulate enough wealth so that you don’t have to work.

I’d like to offer a wake-up call. Here is some bad news: The medium income for males age 65—including Social Security—is only $14,548 a year. And the numbers for women are even worse: $8,189.

Why is it that we live in a country with the most opportunity and wealth, yet the majority of people go through all of their extra $2,000 to $3,000 a year, I would be fine. I could save money and prepare for the future.”

He’s a good employee and you would like to help him out, so you him a $2,000 raise. Well, there is a very high probability that he will be back in your office again next year, saying, “You know what, if I had just a $2,000 to $3,000 more…”

The amount of money you earn is not the issue. Income has no relation to how people do financially. I meet with hundreds of people every year, one on one, to discuss their financial issues. I have seen people who are making very modest incomes—$20,000 to $30,000 a year—who have been able to accumulate large amounts of money. On the other hand, I have met with people making $200,000 to $300,000 a year who don’t have any money.

People allow their standard of living to increase as fast as their incomes. They get a raise or their business does better, and it seems as if there is always a way to spend more money. You can become financially independent—no matter what your income level is—if you do the right things.

The graying of America

There are other problems to contend with relating to accumulating wealth. Our society is changing. Some of your parents and grandparents have been able to let Social Security bail them out in their retirement. But the Social Security system is in trouble.

In 1945, when Social Security was began, it was designed to be a safety net against poverty. It was not designed to be a full-blown retirement system. Not only that, but Social Security has become a disability program as well. People who are permanently or even temporarily disabled can get income from Social Security. This compromises the entire system for those who would like to use it for their retirement years.

In 1945, there were 42 people working for every person on Social Security. In 1984, the ratio was 3.3:1, and by the year 2020 will be 2.4:1. These numbers just don’t work.

Congress is considering different proposals to revamp the Social Security system, including privatizing part or all of it. Whatever finally happens, the reality of the situation is that you cannot rely on Social Security to provide for you in retirement. If you’re younger than 40 or if you’re factoring Social Security as part of your retirement income, you had better wake-up because the system is in jeopardy.
My dad always told me that money grows on trees. I didn’t believe him until I met the owners of tree care companies.

people who are spending $0.70 to $0.80 on a dollar on their standard of living, in large part because of credit card debt. One major way to spend less is to stop paying 18 percent interest to credit card companies.

If you have been through the credit card cycle and survived—or are lucky and smart enough to have avoided it altogether—your next goal is to reduce your taxes. The objective is reduce your taxes to $2.2 to $2.4 on the dollar. You might think that cutting your tax rate $0.02 to $0.04 won’t have much of an impact, but that two percent to four percent difference over a long period can have a huge impact on the amount of money you accumulate.

Some of you reading this may be wondering how to pay only the average of $2.6 on the dollar in taxes. Most tree care company owners are in the 28 percent tax bracket for federal income taxes alone. If you’re in the very highest bracket, you are paying a marginal rate of 39.6 percent, but the average person pays much less. The taxes you pay (and are able to reduce) are primarily state and federal income taxes. You can’t escape property or sales taxes.

Insurance is a necessary evil, but most people pay too much for it. Your goal is to reduce your insurance costs from $12 down to $6.06 on the dollar.

All of these spending reductions are necessary in order to raise your savings rate to a minimum of $0.10 on the dollar. This is serious. You only have one shot at this. And remember, everyone makes enough money.

There are six reasons people fail financially.

1. Procrastination. You can’t succeed until you start. It’s true that half the se-
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cret of success is simply showing up.

2. No financial goals. When was the last time that you had goals and you didn’t get what you wanted? These goals must be in writing, they must be measurable and they must be attainable.

3. Ignorance. People don’t understand what money must do to accomplish their goals. You must have your money work for you as hard as you work for it. If you money isn’t working hard for you, then taxes and inflation will eat away at your savings, because if you don’t you know you’ve got inflation to contend with, you’ve got taxes.

4. Understand and apply tax laws. People don’t understand how taxes work. There are a lot of opportunities to make investments with after-tax dollars and not pay any tax on earnings.

These opportunities are not limited to municipal bonds either.

5. Failure to prepare for the unexpected.


Time is not on your side

Suppose that you want to accumulate $100,000 by the time you are 65. Assume that your savings earn an average of 8 percent a year. If you are 25, it would only take $29 per month to have $100,000 by the time you’re 65. If you are 35, it would take $68 per month or a lump sum of $9,938. If you wait until you are 45, you would need to put away $175 per month or a lump sum of $21,455. At 55, the numbers are $547 per month or a lump sum of $46,319.

When we do financial planning, there are some critical factors. The most important one is time. It takes time to build up enough money to have an impact on the growth of your wealth. In the Phoenix metropolitan area, I see a lot of people who are retired, or at least who are old enough to be retired, working at jobs usually held by people just entering the workforce. They work in fast-food restaurants, shopping centers and grocery stores. I doubt most of them are working because they are looking for a social experience. They are working because their standard of living has shrunk. They are on a fixed income, and they can’t survive on it anymore. They squandered their working years.

Let’s suppose that over the last 20 years, you have been making $2,000 per month, which isn’t a lot. That means that you have made $480,000. How much do you have left?

Let’s suppose again that over the next 20-year period you will do better and make $3,000 per month. I realize these
numbers are modest for most arborists. Nevertheless, at $3,000 per month, you will earn $720,000 over 20 years.

That’s plenty of money. If you’ve been working and trying to put money aside for the past 20 years and you’re not satisfied with what you’ve been able to save and invest, change things!

One of the big benefits of owning your own business is that you are in control. You fight all of your life to become financially independent. You don’t want to lose.

One of the things that you must do to be financially successful is understand compound interest. Albert Einstein called compound interest “the eighth wonder of the world.”

In fact, Einstein said, “There are two different classes of people: The class that understand compound interest and those who pay it.”

Compound interest never takes a day off, works 24 hours a day, seven days a week, 365 days a year, never calls in sick and never complains. Wouldn’t you love to have employees like that? Compound interest is the clock. You cannot stop it, but it takes time to make it work for you.

How do you rate?

The other important determinant is the rate of return on your money, which is absolutely critical. Examine your financial situation. If your money is earning 8 percent or less, you are lending your money out. Every year when Forbes magazine publishes its list of the richest people in America, not one says, “I made my fortune by putting all my money in a savings account.”

The people who make money own businesses and real estate. They invest. You should have no idle money, because if you’re not using your money to make money, then you’re lending it out to people who are getting rich using your money.

Is your money working for you or is it lazy? By the time you factor in inflation and taxes, if your money has to work hard for you.

A young person reading all this might say, “Fine, but I don’t have $10,000 to invest.” And an older person might say, “I have $10,000, but I don’t have 20 years to wait.”

Maybe you are 55 or 60 and you think it is too late to start accumulating wealth. Don’t tell yourself you are too old. You’re not. You have 30 or 40 years left. You have to take advantage of this knowledge now.

Financial planning is not just retirement planning. Many of us want to retire before we reach 65. Some want to have the assets to start our own businesses in midlife. Timely financial planning can help you achieve these goals.

Bill Wilde has been actively involved in the financial services industry since 1972. He specializes in wealth accumulation, asset preservation and estate planning for individual and business owners. He teaches financial planning and money management at the Maricopa County Community College and is a partner in Gold Associates. He may be reached at 800-231-7653.
Dealing With Hazard Trees

By Scott Prophett

The following is a true story that happened to a tree crew in the Midwest. The three-person crew arrived at the job site to prune three trees and remove another. Upon inspection of the tree to be removed, decay was found at the base. The crew decided to not remove this tree until they could get an aerial lift. The client was informed of the situation, and the crew proceeded to prune the other three trees. That night a gust of wind blew the tree to be removed to the ground. There was no damage caused to the client's property. —Norm Hall—

You have a tree that has been identified to be a hazard to the client's property. This tree must be removed, yet there is no way to access the tree with equipment. The tree poses a threat of failing on its own at some point, and you are not sure if it can hold a climber or not. You believe that you can climb the tree safely, but you would like a little added security. What will you do?

This is a common situation that many arborists face. There are plenty of techniques to help us determine if a tree is a hazard or has the potential to fail and cause damage. Other than experienced judgement, however, there aren't clear ways to determine if a hazardous tree can support a climber's weight. When you know a tree is a hazard, but you are not sure if it will hold your weight, what can you do?

There is a technique that has been used with success. I am not offering guarantees, though guying can be a way safely to climb a tree with defects in the trunk and root system. Many arborists use this technique in one form or another.

The basic concept involves attaching ropes to the top portion of the tree or above the defect. These lines are then anchored to the ground or other objects. The idea is that guying the tree securely might give added sup-

continued on page 56
Proper Chain Saw Use... Safety First!

By Rip Tomkins
Vice President, ArborMaster Training, Inc.

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Today's chain saws are lighter, more economical, more powerful and faster running. They are safer, too, yet they remain a potentially dangerous power tool. Statistics show there were over 40,000 reported chain saw related injuries last year in the US alone. That is over 100 every day!

Why are so many people still getting injured? I think it is imperative that people gain a better understanding of the chain saw, how safety features work, how the saw runs and proper operation. When used properly, a chain saw can be a safe tool.

Personal protective equipment—approved hard hat system with hearing protection and safety glasses or a face screen—is a good start. The face screen alone won't deflect many of the flying objects that can fly into your eyes. I remember hating to wear a hard hat with eyeglasses because it was hot and the glasses always fogged up, but you don't fully appreciate your eyesight until it is impaired.

Foot and leg protection is also a must for safe operation, because these are the areas where the majority of injuries occur. Whether you prefer chaps or a trouser with built-in protection, this is the cheapest insurance against a major accident. It is important to remember that no product, short of a suit of armor, is totally chain saw proof. However, protective equipment will increase safety and afford more reaction time.

Understand the reactive forces of the saw. Most people are familiar with the term "kick back," which is a violent reaction when wood comes in contact with the upper corner of the end of the bar. If you use the bottom of the bar to cut, you will be pulled into the wood and, conversely, using the top cutting with the saw closer to the body puts a lot less stress on your back, reducing fatigue.

Remember that no chain saw is built for one-handed use. The primary benefit of small, light top-handled saws is the ease of maneuverability. A good climber should be able to get into position to avoid the need to cut one-handed. Even the strongest person cannot control kick-back with one hand.

Another common practice that should be avoided is the sawyer not wrapping the thumb on the forward handle. A firm grip with the thumb wrapped is a far better defense against possible kick-back.

With apologies to the many lefties out there, the chain saw has primarily been developed for a right-handed world. The bar is on the right side of the saw, and whenever possible it is important to keep your head from being in direct line with the bar. The saw can also be rotated for side cutting far easier with the left hand on the forward handle.

I have touched on some of the many important components of safe chain saw use. I strongly feel this is an area where proper training is the key to a better understanding of how a chain saw should be used. Remember, before starting up... Safety First.

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Proper Chain Saw Use... Safety First!

By Rip Tomkins
Vice President, ArborMaster Training, Inc.

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Today's chain saws are lighter, more economical, more powerful and faster running. They are safer, too, yet they remain a potentially dangerous power tool. Statistics show there were over 40,000 reported chain saw related injuries last year in the US alone. That is over 100 every day!

Why are so many people still getting injured? I think it is imperative that people gain a better understanding of the chain saw, how safety features work, how the saw runs and proper operation. When used properly, a chain saw can be a safe tool.

Personal protective equipment—approved hard hat system with hearing protection and safety glasses or a face screen—is a good start. The face screen alone won't deflect many of the finer particles that can fly into your eyes. I remember hating to wear a hard hat with eyeglasses because it was hot and the glasses always fogged up, but you don't fully appreciate your eyesight until it is impaired.

Foot and leg protection is also a must for safe operation, because these are the areas where the majority of injuries occur. Whether you prefer chaps or a trouser with built-in protection, this is the cheapest insurance against a major accident. It is important to remember that no product, short of a suit of armor, is totally chain saw proof. However, protective equipment will increase safety and afford more reaction time.

Understand the reactive forces of the saw. Most people are familiar with the term "kick back," which is a violent reaction when wood comes in contact with the upper corner of the end of the bar. If you use the bottom of the bar to cut, you will be pulled into the wood and, conversely, using the top cutting with the saw closer to the body puts a lot less stress on your back, reducing fatigue.

Remember that no chain saw is built for one-handed use. The primary benefit of small, light top-handled saws is the case of maneuverability. A good climber should be able to get into position to avoid the need to cut one-handed. Even the strongest person cannot control kick-back with one hand.

Another common practice that should be avoided is the sawyer not wrapping the thumb on the forward handle. A firm grip with the thumb wrapped is a far better defense against possible kick-back.

With apologies to the many lefties out there, the chain saw has primarily been developed for a right-handed world. The bar is on the right side of the saw, and whenever possible it is important to keep your head from being in direct line with the bar. The saw can also be rotated for side cutting far easier with the left hand on the forward handle.

I have touched on some of the many important components of safe chain saw use. I strongly feel that this is an area where proper training is the key to a better understanding of how a chain saw should be used. Remember, before starting up... Safety First.
upper portion of the tree.

Remember that a knot can reduce the rope’s strength up to 50 percent. Ropes with spliced eyes and a shackle attached have also been used. Also using a hitch to attach the shackle or other snap has been used without losing as much strength as a knot. Depending on the type of rope, a hitch may only reduce the rope’s strength by 10 percent to 30 percent. The goal with the guy ropes is to support the tree in a manner similar to a tent or utility pole. In some cases, only one rope is needed, whereas in other cases, as many as three or four ropes may be necessary.

Anchoring the rope may be done several ways. Guy ropes have been attached to the base of nearby trees, screw in ground anchors and also to heavy trucks. Again, the termination of the rope is best done with a hitch. Getting the rope taut before it is tied can be accomplished several ways. In some instances several crew members can pull the rope tight enough. The use of a prussik and come-along or pulley system has been effective where the crew’s strength was not sufficient. It has been recog-
nized as best practice to pre-load or take the stretch out of the guy ropes to reduce the chance of significant movement of the tree.

Ground anchors should be rated at several thousand pounds. The type of soil that will hold the ground anchors is also important. Soft or loam-type soils may require the use of four anchors spaced apart and attached together with steel pipe to hold a single guy rope.

Guying is a technique that can add stability to a hazard tree. It offers no guarantee. If you have any doubts about the tree's structure—even with guy ropes—do not climb the tree. Walk away and live to see another day.

Scott Prophet works for The Care of Trees in Herndon, Virginia.
Wanted:

Innovative Techniques and Equipment for the Safe Removal of Hazard Trees

By Norm Hall

Various conditions can make a tree a hazard. Energized lines, storm conditions, diseases, decay, mechanical damage, construction and animals can all add to the formula. Just one or two of these conditions should send up a red flag to an arborist.

Before performing any work on the tree, it must be inspected for hazards. Bear in mind that a tree may have one or more defects. After the tree is deemed a hazard what do you do?

The Safety Committee of the National Arborist Association has formed a Hazard Tree Subcommittee that will explore the different techniques to remove hazard trees and limbs. The subcommittee is comprised of arborists from around the United States who specialize in dealing with hazard trees. They are seeking out products and techniques to research for use in hazard tree removal. The committee is also researching techniques and equipment from other industries. When information is obtained, it will be passed on to you.

The subcommittee also needs your help. They are in need of ideas and techniques that you have used in the field or dreamed about to remove hazard trees. No idea is too small or crazy for the subcommittee. They urge you to send your ideas, photos etc., thoughts and concerns to the NAA. The subcommittee is also open to anyone who is interested in helping the industry by joining in our search. For more information, contact Peter Gerstenberger at 800-733-2622.

Norm Hall works for The Care of Trees in Wheeling, Ill., and a member of the NAA Hazard Tree Subcommittee.
Dealing With Price Competition
How to win the battle against low-ball bidders

By Wayne Outlaw

Price competition is becoming more prevalent in today's tree care industry. Customers are cost conscious and shop for the lowest price more than ever before. The intensity of price competition is having a dramatic effect.

Because of these price pressures, tree care companies are grappling with how to sell against a cheaper price. Unfortunately, most focus on the wrong strategy. When faced with, "I can get it somewhere else cheaper," or "Your price is too high," the most common response is to lower your own price. A better strategy for reducing price pressure is to increase the customer's perception of value.

Commercial arboriculture is stocked with the names of defunct companies that tried to win work by discounting and lowering prices. Unless you have the highest volume and the lowest expenses, you can not win the discount game. And if you follow all the rules and tax laws, take out all the required insurances and pay your employees a living wage, you will have a hard time making money as the lowest bidder. Being able to sell against a cheaper price, therefore, is essential to survive.

Customers have options for their tree care, including ignoring it completely. They may hire someone with less skill or knowledge, but they always have a choice. To survive and prosper in the competitive '90s, you must be able to sell your "value" compared to someone who offers a cheaper price.

Selling value
To sell your value, begin by understanding what customers perceive as valuable. Research indicates that customers value quality, capability, reliability and productivity in the products they buy. In services such as tree care, they value confidence, trust, reputation, resources behind the organization and reduced risk. Make your job of selling value easier by building these into your work.

To win the value battle, you must take a proactive approach to creating, communicating and delivering value to your customers. This approach will build long-term customer relationships, improve loyalty and increase results. It is a much better strategy than discounting prices because both you and the customer win.

The first step in creating value is to understand who your customers are and, most importantly, what their needs are. Only when you understand the different types of customers can you know how they are different, how they are similar, what they value and for what they will pay.

This examination of customers and potential customers will help determine the price level or premium they are willing to pay for tree care. For example, a customer in a more affluent neighborhood may pay more. Some customers, no matter how much they perceive your value, have little ability to pay a premium. Others have the ability to pay if they feel your premium is justified.

Identify your strengths
Knowing the types of customers you serve is not enough. You must know individual customers and their specific needs. By understanding each customer's situation and the problems they want to solve, you will be able to determine their real need for your services. Most importantly, when you know the results the customer receives, you'll then be able to determine the true benefit or value of your expertise.

It is critical to examine your tree care company's services to determine the "real" value delivered to customers. Our experiences in workshops and seminars indicate that while some understand their customers, few do a good job of self-analysis. Management needs to conduct a self-analysis to examine the organization and its services, especially from the customer's point-of-view.

Self-knowledge is power. To understand your organization, ask questions such as these:

* What do you do so well that you far exceed a competitor?
* Why have current customers chosen you?
* What is truly unique and valuable about your services?
* In what ways are you vulnerable?
* In the past, why have you lost business or customers?
* Why would someone not buy from you?

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Creating awareness

Once you know your customers and know yourself, it is imperative that you create a perception or an awareness of your value. First you must know and communicate clearly your value to your employees. If the owner perceives value but the employees dealing with customers every day do not, it will not be communicated to the customer. The employees at the customer’s location are your company’s messengers. Make sure they know and believe the message.

Service-based products

A company can increase its perceived value by creating “service-based” products, which are helpful because they make it easier for a customer to make a buying decision. Service-based products not only formalize the relationship and commitment the customer has to the company, they provide a structure that makes the customers feel more comfortable with the relationship. Few customers like open-ended type relationships where conditions, cost and value are unspecified. An hourly rate does not define cost, only the method of determining cost. An example of a “service-based” product is to combine specific services, say pruning and fertilization, into a package for a specific price.

Communicating value

Once you have created a perception of value within the company, it must be communicated to the customer. Have you ever said to yourself, “We are much better than the competition, but our customers just don’t seem to understand”?

This classic communication problem occurs because a customer’s actions and decisions are not based on facts, but a perception of facts. If a tree care company has a strength or value that is not communicated to the customer, it has no effect on the customer.

Many people think about ads, mailings, press releases and other public-relations devices as communication. These are important; however, you must not forget to pick up the phone and call your valuable customers periodically.

A very simple way to ensure this happens is to divide your customer list into alphabetical sections and call them at preset intervals. For example, by dividing the customer list and calling through seven letters per week, you can ensure that you talk to all your customers within a month. Try calling your customers to check on them, not just to handle a problem or to sell something, and see if the results don’t soon appear. This is a perfect project to undertake during the slow months of January or February.

It is easy to be pressed for time and not take time to communicate well. You must also take the time to let customers know what you have done for them.

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you have gone the “extra mile” and corrected a problem, the customer must be told this or it will have little value because it may have appeared routine to a homeowner without tree care expertise.

Another simple but powerful technique is to call at the end of each service to explain what has been done, answer any questions, thank them for their business and invite them to call if they have any difficulty. At residential sites especially, arborists often do not talk to anyone. This simple, but often overlooked, communication technique builds relationships.

**Effective selling**

The best products and services in the world will not be effective unless the salesperson selling them has both the skills and the confidence to sell against a lower price. Many times people rely on service to sell itself. As competition gets greater, the difference between winning and losing a sale, many times, is a salesperson.

A salesperson’s results can be boiled down to the interaction of the two factors of sales skill levels and activity levels. Even if significant activity is generated by advertising and reputation, unless the salesperson has a high level of sales skill and confidence, the result will be lost sales. Even if your sales force are highly skilled, they cannot be successful unless they have a sufficient activity level and generate ample prospects.

**Customer service**

In everything you do, you must serve the customer well. It is your primary determinant of success. First you must determine what customer service is. It is easy to lose sight of what service really is.

A study by Forum Corporation determined that only 30 percent of customers are lost due to product or price. Sixty-five percent were lost the way they were treated or the attitude of an employee. Regardless of the quality of your tree care work, it is critical that you treat customers well in all instances.

You cannot successfully compete on price unless you have the most efficient operation. Even when you are the most efficient, someone else can become more efficient or is willing to sell at a loss. This may be like the gunfighter in the old West. There is always a faster gun and a lower price. This may be why few gunfighters or companies that compete on price alone survive for long.

Research has even indicated that very few people buy the cheapest price. For you to be successful now and in the future, you must continually increase the customer’s perceived value.
Editor’s note: With the growing internationalization of commercial arboriculture, TCI magazine is increasingly looking beyond America’s borders for new ideas, practices and equipment. The safe operation of the tools and equipment of the trade transcends national boundaries. The following outlines a basic maintenance and operation, training and assessment package available through SAC Arboriculture Services—a commercial division of the Scottish Agricultural College. Upon successful completion, candidates are issued with written proof of competence to a nationally acceptable standard. American readers should bear in mind that standards and practices in the United Kingdom may differ from state and federal regulations in this country.

Training for Safe and Competent Use of Chippers

By Paul Hanson

The last ten years has seen a massive upsurge in public concern regarding “green issues.” In response, the managers of our green spaces—both public and private—are moving toward management systems that will ensure that our vegetative resources are sustained. One of the more significant contributions to the former, is delivered through the recycling of green waste utilizing chippers.

The mechanical plant varies enormously, from the massive industrial tub-grinders through the typical arborists chipper and on to the domestic garden shredder. The principle objective in all cases is to render green and woody waste into a mulch-like
Chippers are primarily designed to reduce green and woody waste to small particles. Flesh and bones are not a problem.

There are so many models of chipper available with a multitude of safety features and operating anomalies that even a very thorough training package would only be applicable to individual models. There are, however, essential safe working practices that apply to almost every chipping operation encountered in practical tree care.

Operator personal safety

Personal Protective Equipment (PPE), such as safety helmets, eye protection, ear protection, gloves for handling fuel/oil and other potentially harmful materials, safety boots, appropriate clothing for general operation and for working on or adjacent to the highway, fire extinguishers and first aid kits should be used.

Routine Maintenance

In order to keep training flexible and
Chipper Safety

pertinent—daily, weekly and monthly maintenance should be undertaken and studied following the operator’s or manufacturer’s handbook. Periodic and routine maintenance tasks should be demonstrated and explained, so that an untrained employee does not attempt unsupervised field maintenance.

Prior to commencing work or maintenance of any type, new operators must be able to locate and ensure that a clearly marked OFF switch is operational. The drum/disc and cutting knives should be checked for damage, wear and the correct setting before every operation. Gloves are to be worn when handling the knives.

It should be emphasized that the machine must be switched off before removing the access cover to the cutting system. When exchanging dull or damaged knives, the locking nuts must be re-tensioned to the “torque” settings as described in the manufacturer’s manual. Trainees should be taught to ensure that pulley belts are correctly tensioned, serviceable and guarded, particularly P.T.O. shafts where operational.

Chipper knives have a finite life span, and it is clearly dangerous to use knives when worn beyond the manufacturer's specification. Fitted knives must be the same size and sharpened to the manufacturer's given sharpening geometry. A discrepancy in size will cause unnecessary and dangerous drum vibration during the cutting operation. Also, dull knives will not cut efficiently, and in the worst-case scenario, damaged or incorrectly fitted knives may shatter and be ejected through the discharge chute.

Fueling is a common hazard in the use of many tree care tools. Gas vapor is invisible, heavier than air and capable of flowing considerable distances after fueling or spillage. A safe distance (10 yards) must be maintained at all times from sources of ignition, and any spills must be cleared where possible. Fuel containers must be labeled and approved for use.

Site organization

Operators must ensure that site exclusion precautions are carried out before work commences. If the chipper is to be unhitched from a truck, a clear, firm unobstructed surface will be required. The handbrake must be applied (where fitted) and the wheels chocked.

It is safer to position a chipper so that in a highway situation, feeding operations can take place from the side furthest away from traffic. The
When feeding material into the chute, the operator should stand to one side, out of line with the feed rollers.

Operation

It is the responsibility of the chipper operator to check that the material to be chipped is free from stones and metal. In many cases the operator has not produced the material he is called upon to chip.

The operator must become familiar with the feed system of the chipper, which includes the location of the forward, stop and reverse positions (where applicable) located on the feed roller drive control. When feeding material into the chute, the operator should stand to one side, out of line with the feed rollers. Materials should be released once the feed roller has taken it.

discharge chute must be positioned to prevent chips and/or other material from posing hazards to either colleagues or passing pedestrian and vehicular traffic. (The ideal, of course, is to discharge chips exactly where they are required for further use or removal from site.)

The feed chute must be checked for lodged debris and the cutting disc/drum for clear passage over the cutting anvil. It is unlikely that a tree care operation will require the constant use of a chipper. Therefore, it is sensible to remove the ignition key during longer periods of inactivity when operators may be engaged in other duties to safeguard against unauthorized operation. [This is an ANSI "shall" requirement in the United States.]

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Chipper Safety

For smaller, less woody material, the operator should take advantage of longer branching material to ensure safe delivery of the smaller material to the feed roller or employ the use of a push stick at least a yard in length. Under no circumstances should an operator place any body parts inside the feed chute of a running chipper. To clear the inevitable blockages, rollers may be reversed followed by another attempt to feed. In the case of major blockage, the machine must be switched off.

Transporting chippers

Machinery of this type should never be moved with the engine running. The disc/drum should be locked and the feed and discharge chutes aligned in the transport position. The vehicle lighting and towing requirements for highway use must be complied with, and all safety chains should be connected to the towing vehicle via an appropriately rated tow hitch.

Practical assessment to ensure competency

For the purposes of assessing competence, operators should be required to perform a range of tasks under replicated working conditions. Prior to commencing work, a risk assessment must be carried out focusing on the actual assessment site. Then, appropriate control measures must be carried out.

Before new hires are allowed to operate a chipper on their own, they should be assessed for competence in three areas.

1. Preparation for work
The new employee must convert the chipper from transport mode into the working position. The key points are:
- correct linkage/drawbar settings
- use of stabilizers, where applicable
- feed chute set and discharge set as appropriate to the chipper model.

The general serviceability of the chipper will be verbally reported upon following inspection. Here, the key points are:
- secure attachment of lift arms, top links and stabilizers
- secure jockey wheel and chocks
- correct machine alignment
- correct engagement of P.T.O shaft or other drive mechanisms
- secure fitting of all guards
- guards to be in good condition
- fuel/oil levels to be correct
- OFF switch working
- drive belts in good condition.

2. Operation of the machine
New employees should feed brush into the chipper under the supervision of a trained operator. Assessment criteria should focus on:
- safe procedures followed throughout the operation
- the working area to be kept clear of others
- the material to be chipped should be checked for foreign objects and...
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3. Maintenance

Inevitably, machine operators will have to follow manufacturer's manuals for routine maintenance. Employees should demonstrate a knowledge of cutting system requirements indicating to the supervisor the correct setting of the anvil and security of the knives and anvil. They should be able to remove and replace at least one cutting knife, illustrating the use of setting tools securing all nuts and bolts as recommended by the manufacturer.

One would hope that a productive, safe and environmentally aware operator is now available for gainful and productive employment in today's tree care market.

Paul Hanson is a consulting arborist with SAC Arboriculture Services, a commercial division of the Scottish Agricultural College in Lanark, Scotland.
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The Value of Streetscape Trees

By Matthew L. Petitjean, H. Dennis P. Ryan, David V. Bloniarz
University of Massachusetts, Northeast Center for Urban and Community Forestry

Streetscape Values

Street trees have many forms of value. Trees offer personal and social values, which include recreation, aesthetics and a human relationship with nature. For this reason city parks with trees are often the oasis sought by urban dwellers on hot summer days. The environmental values of trees include engineering uses, such as erosion control, pollution reduction and sound control. City street trees reduce noise and air pollution from automobiles and buses and lessen wind and water soil erosion by stabilizing soil particles. Climatological values affect our heating and cooling by blocking winter winds and intercepting up to 90 percent of summer solar energy. These values produce a more comfortable living environment and reduce utility costs.

The economic values of urban woodlands include pulpwood, firewood, chip mulch and lumber. These values are more often found in small urban woodlots rather than in an individual street tree planting. However, colder climates certainly benefit from firewood for the winter months. Chip mulch is often used in landscape settings for both aesthetic purposes as well as plant health purposes.

Calculating an actual dollar value of street trees is useful for a number of reasons. Below are some of the methods and the reasons why it is important for every city and town to conduct an accurate valuation.

Smaller urban trees have a replacement value, which is the actual cost of replacing the existing tree with the same or similar nursery stock. If the existing tree is available from the nursery, then the value of the existing tree is simply the planted price of the tree from the nursery. Specimen plantings in key locations are often assessed an individual value. The most common method of assessing value to individual trees is using the trunk method formula devised by the Council of Tree and Landscape Appraisers. The following example shows how a basic price is established and then adjusted by four key factors:

1. Size
2. Species
3. Condition
4. Location
Example: We want to establish the value of a 15 inch DBH (or 177.46 square inch) sugar maple in fair condition located on a city street.

First a per square inch "basic price" is determined based on the largest available and transplantable tree.

**Example:**

the largest available sugar maple from a local nursery is a 7- to 8-inch caliper (or 44.23 square inch) sugar maple. The nursery cost for this tree is $1,400. Using these figures, a basic per sq. in price would be $31.60 (cost divided by area ($1,400 / 44.23))

1) **Size**

This basic price is then adjusted for DBH (diameter at breast height; measured at 4.5 feet). When evaluating an individual tree, the larger the DBH, the more valuable the plant. The per square inch basic price is multiplied by the area of the evaluated tree that is not replaceable; the difference in area between the existing tree and the replacement tree (see Figure 1).

2) **Species**

Tree species affect value. For example, a weak, wooded willow is less valuable in an urban setting than a stronger sugar maple. For this reason, associations such as the International Society of Arboriculture have established a tree species ratings. (For this example, the "New England Tree Species Rating and Valuation Guide" published by New England Chapter of ISA, was used in Brattleboro,

---

**Figure 1**

Area of existing tree

Area of replacement tree (available from nursery)

*Value is based on gray area only. This is the difference in area between the existing tree and the replacement tree. Area is calculated by multiplying radius squared by Pi (3.141 X r²)

Example: Existing tree area (177.46 sq in) minus replacement tree area (44.23 sq in)

177.46 square inches minus 44.23 square inches = 133.23 square inches.

Basic price ($31.60) multiplied by difference in area (133.23 square inches).

133.23 square inches X $31.60 = $4210.06
Vt.) These ratings are based on a tree’s characteristics, such as strength, growth rate and habit—as well as disease and insect resistance. According to these ratings, a sugar maple would have an 80 percent to 100 percent species rating. A lesser valued willow would have a 40 percent to 60 percent rating.

**Example:** $4210.06 (from above) X .90 (Average sugar maple rating) = $3789.05

The remaining adjustments are based on the species adjusted value (3789.05) plus the planted cost of the replacement tree (the white area in figure 1). It is common to multiply the nursery cost by three to estimate the planted price. Another common method is using the median of three local contractors’ installed prices.

**Example:** nursery price $1400 X 3 (factor to establish planted price) = $4200
Add the above adjusted price $3789.05 + estimated planted price $4200 = $7989.05

**3) Condition of the tree being evaluated**

A condition rating depends on the tree’s structural integrity and health. This information is often assessed during a tree inventory. In addition, a percentage is usually assessed to the basic price. One common method is using good (90%), fair (70%), poor (50%) and dead (0%).

**Example:** adjusted price from above $7989.05 X fair condition value .70 = $5592.33

**4) Location**

The location of a tree, also expressed by a percentage, differentiates between trees planted in a pasture behind a build-

<table>
<thead>
<tr>
<th>Species</th>
<th>% of inventory</th>
<th>Size DBH</th>
<th>Radius</th>
<th>Area Sq. in.</th>
<th>Cost un-planted</th>
<th>Price per in. sq. in./cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acer</td>
<td>39%</td>
<td>7.5&quot;</td>
<td>3.75&quot;</td>
<td>44.24</td>
<td>$1400</td>
<td>$31,646</td>
</tr>
<tr>
<td>Fraxinus</td>
<td>2%</td>
<td>6.5&quot;</td>
<td>3.25&quot;</td>
<td>33.23</td>
<td>$1250</td>
<td>$37,618</td>
</tr>
<tr>
<td>Gledista</td>
<td>5%</td>
<td>6&quot;</td>
<td>3&quot;</td>
<td>28.31</td>
<td>$600</td>
<td>$21,192</td>
</tr>
<tr>
<td>Quercus</td>
<td>2%</td>
<td>6&quot;</td>
<td>3&quot;</td>
<td>28.31</td>
<td>$650</td>
<td>$22,958</td>
</tr>
<tr>
<td>Tilia</td>
<td>5%</td>
<td>6&quot;</td>
<td>3&quot;</td>
<td>28.31</td>
<td>$600</td>
<td>$21,192</td>
</tr>
<tr>
<td>Total</td>
<td>53%</td>
<td>6.4&quot;</td>
<td>32.5</td>
<td></td>
<td></td>
<td>$900</td>
</tr>
</tbody>
</table>

**Streetscape Scale:**

establishing the value of more than one tree

The preceding is a common method of assessing the value of an individual tree. Calculating the value of every tree in a streetscape individually may not be a realistic option, due to total number of trees and time and resources. In a field example, the town of Brattleboro, Vt., established a green infrastructure value by determining the “average street tree.” Rather than establishing the value every tree, the value of the average tree is calculated then multiplied by the total number of trees inventoried. The town then arrived at a “total green infrastructure value.” The average tree value is calculated using the Council of Tree and Landscape Appraisers formula.

**Brattleboro, Vermont**

As detailed above, the basic per square inch price needs to be calculated.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Avg. Brattleboro value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. species rating</td>
<td>76%</td>
</tr>
<tr>
<td>Avg. condition rating</td>
<td>76%</td>
</tr>
<tr>
<td>Avg. Diameter at Breast Height</td>
<td>72%</td>
</tr>
<tr>
<td>Avg. tree replacement size</td>
<td>15 inches (177 sq. in.)</td>
</tr>
<tr>
<td>Fixed street tree location value</td>
<td>6.4 inches (32 sq in)</td>
</tr>
<tr>
<td></td>
<td>75%</td>
</tr>
</tbody>
</table>
using un-planted nursery costs. Because the ecosystem contains more than one species of tree, the per square inch price is based on the most prevalent species found in Brattleboro. Table 1 lists the five most prevalent species and their percentages. For example, of all the inventoried trees in Brattleboro, 39 percent are maples (Acer). Nursery values were established from three local nurseries with the price based on the largest available transplantable tree. This is a very important step in assessing accurate values, because nursery prices and installation costs will vary by region.

Table 1 shows that the average size replacement tree was a 6.4-inch caliper tree costing $900 wholesale, not planted. Using this data, we calculated a per square inch value of $27.69. ($28.00) Calculated by dividing average price ($900) by average square inch (32.5 sq in).

Using a sample of approximately 30 percent (about 300 trees) of the collected, usable data, an average Brattleboro tree was calculated (see Table 2). These averages from 300 trees will be applied the same way as an individual tree.

### Methods

Using the formula and the same steps as described above, the value of the average Brattleboro tree was calculated (see table 3). In our example, estimated planted price was established by multiplying the average nursery cost ($900 from table 1) by three. A factor of three was used to factor variables in planting costs. Our basic per square inch price is $28 (from table 1). Species ratings were assessed using the New England Chapter of ISA’s evaluation guide. Condition ratings were from data collected by inventory volunteers and a fixed 75 percent value was assessed for our streetscape locations.

### Streetscape value

Using the values from Table 3, we can conclude that the average Brattleboro tree is valued at $3100. Brattleboro has inventoried approximately 1,000 trees, at a calculated streetscape value of $3,000,000. Since the 1,000 trees do not represent the entire town of Brattleboro, as more data is collected total value will increase.

Arriving at an accurate estimate of value must also include the negative values. Trees, especially urban trees,
Table 3

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
<th>Method</th>
<th>Adjusted dollar value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic price based on 145 sq. inches</td>
<td>145 X 28 =</td>
<td></td>
<td>$4060.00</td>
</tr>
<tr>
<td>177 (existing tree) - 32 (replacement tree) = 145</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic price adjusted by species rating</td>
<td>76%</td>
<td>4060.00 X .76</td>
<td>$3085.60</td>
</tr>
<tr>
<td>Adjusted price plus planted cost</td>
<td>7%</td>
<td>$2700.00 + 3085.60</td>
<td>$5785.60</td>
</tr>
<tr>
<td>($900 (avg. nursery $) X 3 = estimated planted cost)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price adjusted by average condition</td>
<td>72%</td>
<td>5785.60 X .72</td>
<td>$4165.63</td>
</tr>
<tr>
<td>Price adjusted by fixed location</td>
<td>75%</td>
<td>4165.63 X .75</td>
<td>$3124.22</td>
</tr>
</tbody>
</table>

The “average” Brattleboro tree is valued at $3100 (rounded to nearest hundred).

Conclusion

Cities and towns with or without completed street tree inventories will benefit from assessing dollar values to their streetscape trees. Many communities are aware of what management strategies need to be carried out on their urban trees. What they lack, however, is adequate funding to carry out these duties.

Knowing the total streetscape value may act as a leveraging tool to obtain funding for management. Using the total streetscape dollar value as a percentage of a town’s annual maintenance budget can be used when seeking funding. The total allotted budget for the tree warden of Brattleboro is approximately $3,000. That means the annual tree maintenance budget for Brattleboro is only .1 percent of total streetscape asset value. To lobby for a budget of .005 percent of total asset value would result in an annual budget of $15,000. Using percentages is effective because even a very low percentage will result in an increased budget. The percentage can also be compared to budgets of buildings and other community assets. Notably, the values of trees increase

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each year, rather than decrease as most other assets.
Total streetscape value may also be used as part of a emergency management response protocol. Cities and towns may need to apply for emergency management funds through government agencies, such as FEMA, or a state equivalent. Lost tree value could be incorporated into each catastrophic event. The value could then be used as a leveraging tool similar to the maintenance budget plan described above.

Individual trees values are important for insurance and the Internal Revenue Service. When town property is damaged or destroyed maliciously, insurance may be an option for recovery. Also keep in mind that the Internal Revenue Service recognizes lost landscape value as a casualty loss that can be deducted from taxable income. These reasons support the assessment of individual tree values, especially specimen trees.
In order to spark an interest from the business sector, streetscape values could be correlated to shopping patterns. If businesses thought that maintaining the streetscape would increase their business, they may help support “tree maintenance funds.” Shopping districts could create an alliance with tree wardens to “adopt” the streetscape, creating a link between business and commerce. This valuable link
creates pride and a feeling of involvement for local businesses.

Dollar values are important to a community’s overall net worth. The streetscape is an often overlooked asset when determining “value.” High streetscape values could attract not only business, but residents as well.

In the example of Brattleboro, several advantages have been gained for the community. Inventory volunteers have concrete, valuable feedback, city officials notice a serious budget deficiency and valuable data has been calculated that can be used for future projects. As more communities establish streetscape values, a standard budget percentage could be calculated. This standard could then be used for lobbying and leveraging for a “standard” tree maintenance budget.

When calculating the value of street trees, never forget that tree values should be reasonable. Inaccurate or inflated tree values will only degrade the valuation process and distract from a standard budget percentage.

Matthew L. Petitjean is a graduate student in the Department of Forestry at the University of Massachusetts Amherst. H. Dennis P. Ryan is a professor in the Department of Forestry at the University of Massachusetts teaching arboriculture and urban forestry. David Bloniarz is the project coordinator for the Northeast Center for Urban and Community Forestry at the University of Massachusetts. The authors wish to thank James Ingram of Bartlett Tree Expert Co., for his advice and assistance.

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Reform Takes a Back Seat to Politics

How are things in the nation's capital?

Frankly, I'm not sure. While I'm usually keenly attuned to every little thing that happens on Capitol Hill concerning the commercial tree care industry, this month I find I have nothing to write about. It's not that nothing is happening. Certainly, all of the issues that concern commercial tree care are hot topics in Congress right now. The heat is on for regulatory reform from OSHA to the IRS, and it seems that lately every federal official is making impassioned speeches that break into nice sound bites. Wait, check your calendar ... It is November 1997, the pre-dawn hours of the next election campaign. It's time once again for table-pounding and stern countenances as our nation's leaders make a show of protecting the interests of the American people. We all know the story, and we're getting ready to read it again.

The trouble is that there has been some finely crafted legislation presented this year. Some long overdue attention has been paid to the archaic practices of federal agencies whose individual powers have gotten way out of control. OSHA certainly has been under fire, the Department of Transportation has been shaken, if not stirred, and the IRS ... the IRS! Who ever thought anyone would dare to take on that bureaucracy? Legislators rolled up their sleeves and started on some meaningful changes, particularly regarding

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OSHA, long before the elections started coming into focus again. For a while, the commercial tree care industry could hold its breath waiting for regulatory relief without fear of suffocation.

Well, exhale, but don’t give up. The first indications of discouraging delays were contained in a couple of brief articles in the Bureau of National Affairs’ (BNA) Occupational Safety and Health Reporter. The May 1, 1996 edition quotes Vice President Al Gore as fighting on behalf of OSHA. “We will not let (OSHA’s) 25th anniversary be it’s last. I guarantee that,” Gore said.

He went on to praise OSHA for the progress made over the years. In a Sept. 17, 1997 BNA article, it was reported that the Clinton administration has declared OSHA “so bad, so useless” and adversarial to employers that “the agency has to be totally reinvented.”

Unfortunately, the administration isn’t willing to consider any of the many OSHA reform bills introduced by Republicans in Congress, which is nothing new because it has not entertained any of them in previous years either. Instead, the Clinton administration believes that only its own re-invention efforts will save OSHA.

Politics as usual? Yes. But here we are, getting close to campaign time with very important issues on the table—just one of them—one that is critical to the commercial tree care industry—has been effectively locked up on the House floor, lest anything too controversial be looming in the headlines come November.

What is Congress going to look at? Legislation that is guaranteed a veto or the Clinton administration’s re-invention efforts? Capitol Hill spectators might remember the “Re-invention of Government” promise from the last go-round in 1996. This was the initiative that brought the famed Missouri 500 Voluntary Participation Project (VPP), and similar programs, that had to be shut down due to some illegal data collection activity by OSHA. Maybe you were one of the lucky employers who got a “participate or else” letter. Hopefully you were not one of the employers whose companies suffered a crew member fatality while trying to follow confusing standards impropriately imposed on an industry that has been trying to tell OSHA what does work for us, to little avail.

It really doesn’t matter who is president or which party introduces which legislation or whether reform and relief come from Congress or OSHA itself. The point is, something needs to happen. These issues are too important to fall by the wayside in an election year. The National Arborist Association will not give up, and neither should you.

For our part, by the time this issue of TCI goes to press, the NAA will have already been to Washington to offer information to the Senate Labor and Human Resources Committee to be used in the confirmation hearings for Charles Jeffers, who has been nominated as the new OSHA Secretary. For your part? Keep those cards and letters coming. Tell the president, vice president and your elected representatives what is important to you, and how those concerns will influence your voting decisions.

Amelia Reinert is deputy executive director of the National Arborist Association.

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Back to Basics:
Time-Tested Chain Saw Techniques Ensure Safety

As with many of the tools common to arborists, running a chain saw requires practice, careful planning and preparation. With the following tips and instructions—plus a little common sense—arborists can help avoid injury and guarantee the job gets done accurately, efficiently and safely.

Saws in all shapes and sizes

A chain saw is a powerful, yet potentially dangerous piece of equipment, and it should be treated as such. When selecting a saw, look for top-notch safety features. Saws should include features designed to reduce the risk of kickback, such as low-kickback chains, a chain brake designed to stop the chain should kickback occur, and a small-radius guidebar. Also, look for a high power-to-weight ratio and an antivibration system to reduce saw vibration in the front and rear handles. This is especially helpful for longer jobs that require a full day of cutting.

A fairly lightweight saw with little vibration goes a long way to cut down operator fatigue—one of the most common causes of tree-cutting accidents. Fatigue contributes to mistakes and inattention that can prove dangerous to even the most seasoned chain saw user. [See related article.]

Choose a saw that fits the needs of the task at hand. When climbing for tree trimming, select a top-handled saw that offers good balance and the best safety features.

Manufacturers are continually updating and improving equipment. Some new features to look for are textured rear handles, thumb grips and trigger finger supports, plus a loop in the rear handle, allowing a strap, lanyard or carabiner to be attached quickly and securely.

Of course, efficiency is critical to the arborist. When cutting smaller limbs and branches, a high-speed saw is best; saws running at 13,000 rpms or more are well-suited for cutting smaller limbs quickly and efficiently.
For cutting large branches or bucking wood on the ground, a mid-sized saw with a bar length of approximately 16 to 20 inches offers maneuverability and a lighter weight. Combined, these features help users get the most power out of the saw and reduce the risk of the bar tip coming in contact with adjacent logs or branches.

For cutting the bole of larger trees, select a larger saw with high torque and a bar sized between 24 to 32 inches. Some stump cutting calls for even longer bars that can smoothly tackle trees.

**Inspect the saw**

The following steps should become habit before using a saw. This checklist will keep equipment in peak shape and help protect operators as well.

- Make sure the chain brake is clean and free of sawdust or dirt, and check to make sure the brake band is not overly worn. Follow the operator’s manual to test the chain brake before cutting.

- Air filters also require attention. First, make sure the filter is clean. Then, inspect the filter material for any tears and breaks and check the filter cover for cracks.

- The chain should be sharpened and exhibit proper tension. It is also a good idea to have a spare chain with the unit at all times. A dull chain causes the operator to put excessive pressure on the unit, which can shorten the life of the unit.

- Inspect the condition of special features such as the antivibration mounts. Look for excessive handle movement, which may indicate a faulty or broken mount.

- Inspect the throttle safety lock, chain catcher pin and all the guards and handles. Both the engine and chain need proper lubricants. Check that the oiling system is full and operating properly. Do you have the right gas-oil mix?

Although many types of oil are available for two-cycle engines, look for mixing oils that meet or exceed JASO (Japanese Automobile Standards Organization) FC and proposed ISO (International Standards Organization) and E-GD specifications for two-stroke gas engine oils. A few chain saw manufacturers market oils which meet these standards and are specially designed for the demands of professional two-cycle engine units. These types of oils will reduce smoke and may feature a fuel stabilizer that reduces oxidation. These products also stay mixed and are more forgiving to the many different types of modern gasolines found in the field today.
WHERE MOST INJURIES OCCUR

<table>
<thead>
<tr>
<th></th>
<th>05-14</th>
<th>15-24</th>
<th>25-44</th>
<th>45-64</th>
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<tbody>
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TOTAL 224.32 4653.226 6016.172 7068.43 2091.328 24222.38

* Statistics based on 1995 calendar year from the U.S. Consumer Product Safety Commission

Cut with care

Take care to wear the correct protective apparel, including work gloves, eye and ear protection, protective pants or chaps, a hard hat and steel-toed boots. Once apparel is in place, give the same close attention to the work area in which you plan to work. Carefully plan your cutting job to avoid obstacles such as overhead wires, roads or fence lines.

Work a safe distance away from others, but never work alone. When scouting the work area for possible obstacles, don’t overlook what might be hanging nearby. Always avoid, if at all possible, working in an area with lodged trees or branches.

When getting into position to cut on the ground, always make sure your feet are firmly planted to one side of the cut. Many injuries occur from simple slips and falls. If the tree is on the ground, it can cover up a number of hazards. Small holes, running vines, slippery ice and snow all can throw you off balance.
Start me up

The safest way to start a chain saw is with it sitting on the ground. Be sure that nothing is obstructing the guide bar and chain. With the chain brake engaged, grab the front handle firmly with your left hand. In order to make sure the saw sits securely, put your right foot in the rear handle. Pull slightly on the starter cord until you feel the starter mechanism catch and then pull sharply to start the saw. Once the engine ignites, push the choke in and pull the starter cord again.

Another recommended way to start a chain saw is to lock the rear handle firmly between your legs and under your right thigh, placing your left hand on the front handle, with the left wrist and elbow extended straight and locked. With the chain brake engaged, pull the starter cord sharply.

When drop started off the ground, the left arm should be fully extended and elbow locked. When started by a bucket operator, the saw must be outside the bucket!

continued on page 88
Minimize Fatigue, Maximize Safety

By Mark Michaels

When we talk about cutting safety, items such as site and equipment inspection, product safety features, protective apparel and proper cutting techniques typically dominate the discussion. While attention to these details is essential, don’t overlook the importance of operator comfort—items such as ergonomics, comfortable clothing and engine emissions—and how it relates to operator safety.

Neglecting your personal working environment can lead to fatigue, one of the most common causes of tree-cutting accidents. Fatigue contributes to mistakes and inattention that can prove dangerous to even the most seasoned chain saw user. It is vital to understand and minimize the causes of fatigue.

Smooth-Running Tools

Vibration and noise are two of the leading causes of fatigue. Vibration tires the arms and body, and those who have had prolonged exposure to loud power equipment appreciate equipment designed to reduce noise.

Select a chain saw with vibration- and sound-reduction systems. Hearing protection is essential, as well. There are many designs available to decrease noise levels, and most hearing protectors will list a noise reduction rating (NRR).

One of the surest ways to combat fatigue is to operate equipment you can handle comfortably. Many dealers will let you test the equipment before you buy it. When selecting chain saws, test several models to find the best weight for your strength. Look for a high power-to-weight ratio for the maximum cutting power at the weight you can manage.

Both the American National Standards Association (ANSI) and OSHA have professional standards related to the use of protective apparel during chain saw operation. Such protective clothing, besides dramatically reducing the extent of injury should an accident occur, can reduce fatigue if designed for a comfortable fit.

Equipment emissions are another contributing factor to the quality of an operator’s work environment. Anyone who has worked with prolonged exposure to exhaust knows how fatiguing that can be. Manufacturers have worked to engineer cleaner burning engines and muffler systems on many new equipment models.

Of course, reducing emissions is also a way to help the natural environment. And reducing your fatigue will not only make your “personal environment” more comfortable during periods of equipment operation, it will help you do your job in a safe and proper way.

Mark Michaels is Senior Forestry Product Manager for Husqvarna Forest & Garden Company.
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A retractorable climbing ring is there when needed and out of the way when it isn't. See-through fuel and oil tanks mean there's no excuse for being on empty in the middle of a cut. The rear air intake manifold is positioned to breathe cleaner air and reduce the time lost to filter cleaning. The slim, contoured profile makes handling in tight places easier and STIHL's optional PMN bar and chain is lighter in weight and fast cutting.

The STIHL 019T, with its 2.15 cubic inch engine, weighs just 8.9 lbs. and is available at independent STIHL dealers from coast-to-coast. For more information or for the name of your nearest STIHL dealer call 1-800-GO STIHL (1-800-467-8445) or look in the yellow pages under “SAWS.”

Increase your reach with the STIHL HT 75 pole pruner. The adjustable shaft telescopes to 11.5 feet, and it weighs only 15.8 lbs. The HT 75 is equipped with a 12” STIHL PMN bar and chain which produces a very smooth cut, promoting the tree's healing process.

See us at TCI EXPO '97!

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Safety comes first

Make a mental checklist to go through when you’re working with a chain saw and remember:

♦ Never start a chain saw where you’ve just filled it with fuel. Move at least 30 feet away to avoid the risk of a spark igniting spilled fuel.
♦ Protect yourself by using all the safety features available to you. Always make sure the chain brake is engaged when starting a chain saw or when walking with a running saw. And never modify or remove a chain brake.
♦ Avoid cutting with the tip of the bar except in situations where a bore cut is appropriate. Contact between the bar tip and the wood being sawed may cause the saw to kick back violently. This is especially important to remember when cutting limbs or logs under pressure or where there may be hidden debris near the wood you are cutting.
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After the storm

Although safety should be a part of all limbing and cutting jobs, arborists should note that hazards and danger can dramatically increase after storms. Even if trees aren’t down, there can be many deceptive hazards overhead created by the violent weather.

If you are working in a remote area and few people use or live near the site, it’s best to let the area rest two to three days after a storm. This gives overhead hazards, such as hanging limbs and loose branches, time to settle without harming a cleanup crew.

If you need to create a clearing plan quickly after a storm, carefully analyze the situation, collect the proper safety gear and equipment and then clear with attentiveness and caution.

In general, work in the direction in which the wind knocked down the trees, starting from the outside and working toward the center of the affected area.

Also, never climb into a pile of downed trees. Working from top to bottom, clear trees in this order: leaning trees and loosened root systems, broken trees, toppled trees and then standing tree portions.

Careful cutting means fewer injuries to both trees and chain saw operators. For arborists, attention to safety, technique and upkeep on equipment may take time and effort up front, but each goes a long way toward preventing accidents while promoting our industry’s commitment to high-quality, professional work.
The Model 911 is the first in a line of chippers to be introduced by Doskocil Industries, Inc. Many of the patent pending features on the Model 911 are a direct result of suggestions and ideas from professional arborists like yourself. We at Doskocil Industries are dedicated to design and manufacture quality equipment for your needs.

Swing away top feed roll housing provides easy access to the “Dosko Key Knives.” Our Exclusive Bottom Feed Roll Housing is designed to vacuum debris below the anvil and directly into the chipper flywheel, chamber. No wrapping of fibrous materials to jam bottom feed roller or mess to clean up when access door is left open as with other chippers.

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Classified ad rates: $50 per inch ($45 NAA members) 1-inch minimum. Payable in advance, due the 20th of the month two months prior to publication. Send ad and payment to: TCI, PO Box 1094, Amherst, NH 03031.
It is common sense that electric wires can be hazardous to anyone doing tree work. OSHA Standard 1910.331 states that only qualified employees can come within ten feet of an overhead energized electrical conductor. Plus, OSHA Standard 1910.269 clearly defines who is legally permitted to work within the ten foot boundary. Finally, ANSI Z133.1 dictates very specific training and operational requirements that all tree care personnel need to follow for safety’s sake.

NAA Training Makes Sense. The National Arborist Association has exactly the training you need, whether you are a residential/commercial arborist or municipal arborist. It’s our Electrical Hazards Awareness Program. EHAP offers a simple, economical and practical way to provide training needed by your employees. This program creates awareness of electrical hazards, which is absolutely essential for all tree workers. Plus, EHAP can be used by line clearance tree workers to supplement mandatory training requirements specified in 1910.269.

Like all NAA training materials, EHAP is easy to use and easy to apply. The program is self-paced, to put your employees in control of meeting their goals, and presented by you, to keep you in control of your business. For more information about EHAP, or any NAA program, or to order, call our toll-free hotline, or send/fax the coupon below.

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The Future of Tree Care

Dedication ceremony looks ahead while honoring accomplishments of Bob Felix

On Sept. 15, a seeding of the historic Wye Oak was dedicated in the memory of Robert Felix, executive vice president of the National Arborist Association from 1974 to 1996. Felix passed away unexpectedly on Sept. 23, 1996. The ceremony took place at the National Arboretum in Washington, D.C., where more than 80 friends, business associates and members of the Felix family participated.

The master of ceremonies was Greg Daniels of the F.A. Bartlett Tree Expert Company and a member of the NAA board of directors. Welcoming remarks were heard from Dr. Thomas F. Elias, director of the Arboretum. Paul Wolfe, NAA president-elect and local organizer of the event, commented upon the appropriateness of the oak as a symbol, noting affectionately that, “... the tree leaned slightly to the right, as did Bob.”

The greatest share of the remarks came from George Tyler. Now retired, Tyler is the former president of CUES, Inc., a tree care and utility equipment sales and service company. He served as president of the NAA board of directors in 1988, and was a business acquaintance, colleague and friend of Felix’s for 30 years. Excerpted remarks from his dedication speech appear below.

“Bob became the executive vice president shortly after I came on the board. I was fortunate to have been there when he began to reshape the NAA. Bob took over at a time when the NAA was near collapse.
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“It is fitting that this tree is being jointly dedicated as a living memorial to Bob Felix and to the future of tree care. Bob believed that the future of trees would be best served if those who chose to take care of them had the best possible tools and resources available to develop their technical and business skills. These tools and resources are what Bob set out to provide.

“If you review all of the material that the NAA has offered its members over the years, you will find that it is staggering in its volume and variety. Bob felt that everything he did representing the NAA must have value for the membership. Almost all of us who worked with him heard him say at one time or another that, ‘it should pay to belong to the NAA, not cost.’

“When Bob took the job at NAA, it functioned more like a fraternity than a trade association and he and others of us on the board felt that if the NAA was to take a leadership role in the tree care industry, we had to change this attitude. The new goal would be to welcome all who wanted to join.

“Bob’s work ethic and the high standard of quality is a legacy that I believe will remain with the NAA. This is already evident by the continued high level of quality and service since Bob’s passing.

“Bob had qualities of leadership and organizational skills that set him apart from most of us. It was because of these traits that during his tenure at the NAA, few would dispute that Bob was the heartbeat of the commercial tree care industry.

“The NAA was only Bob and Pat Felix with an office in their home when he started, and when he left us it was a full-grown trade association, serving its membership on multiple levels. The list of accomplishments is long, and the work he left unfinished is being completed. I am sure that this tree and the symbols it represents will continue to grow healthy, today and far into the future.”

The NAA board of directors and staff wish to thank Robert and Nancy Turner for donating the tree, Dr. Frank Santamour of the National Arboretum for procuring the planting site and arranging for the ceremony, the National Arborist Foundation board of trustees for their support of the project, and the numerous others who participated in this ceremony.
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Pleasing All of the People?

By Steve Sandfort

In the late fall of 1979, a group of people were slowly walking up Elm Street in one of Cincinnati’s most populated, downtown communities Over-the-Rhine. The mayor, several community leaders, members of the mayor’s Urban Greenery Committee and a landscape contractor were just as happy as they could be. They were conducting the final inspection for a successful “cut-the-sidewalks-and-plant-145-large-trees,” demonstration forestry project. I have never seen that many people so completely pleased with their accomplishment.

Two older women, both carrying groceries, slowly approached our group, studying each new tree that they passed. When they stood before the same Zelkova tree we had been admiring, one lady very loudly said to the other, “If I had wanted to live in the woods, I’d have stayed in Kentucky!”

That comment brought to mind some words of advice once offered by Eleanor Roosevelt. Upon the death of President Roosevelt, Harry Truman asked the First Lady if she had any suggestions to help him during his presidency. Mrs. Roosevelt replied, “Mr. President, I can not tell you how to succeed, but I can tell you how to fail: Try to please everybody.”

We did not rip out the trees to please the two ladies. Today those Zelkovas are every bit of 14 inches in diameter and 30 feet tall. They are simply gorgeous, loved by the residents who drape lights on them at Christmas.

Shortly after that encounter, the manager of a nearby bank asked the city to plant some similar trees beside his bank. I asked if I could snoop around his cellar first, since in many older cities coal or ice storage areas, as well as delivery shoots, often extended under the sidewalk. While some are still in use for other purposes, most were closed off over time.

To discover whether a problem might exist, I paced from the first floor wall to the basement stairs, then in the basement I paced back to the foundation, reversing direction. In this case, I paced way past the first floor wall and the sidewalk until I was under the street. Down below were an office, several filing cabinets and an old safe—all in use under the sidewalk.

Even though busses were rumbling overhead, we could clearly hear the rush of water coming from a dark room under the center line of the road. Turning on the light, I discovered a 6-inch pipe in the wall shooting a solid stream of water down into a storm drain in the floor.

“Runs like that all the time,” said the banker. “They say it’s from an artesian spring piped from behind the houses over yonder. You can drink it, but I never dreamed all this was under the road! No trees I guess?”

Steve Sandfort is the City Forester as well as an urban forestry consultant in Cincinnati, Ohio.

Do you have a story for From the Field? TCI will pay $100 for published 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.
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The staff of Aerial Lift has extensive experience since 1958 in research, engineering and design of aerial devices. We have an engineering staff member on the ANSI/SAIA A92.2, subcommittee to insure the reliability, quality and safety of all aerial lifts, that a common goal of safer, more efficient aerial devices is upheld. Aerial Lift is constantly striving to provide our customers with the latest in aerial devices and the best service in the industry. It is our relentless effort in pursuit of those goals that ensures our customers maximized operating economies.

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Aerial Lifts built in
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National Arborist Association

Tools of the Trade

Products and Services Catalog
How can I use NAA training videos?

There are a number of ways to present our videos. We suggest:

✓ Show our videos to new employees before they ever set
  foot on a job site to avoid costly
  new employee injuries and docu-
  ment basic safety training.

✓ Present a video at regularly
  scheduled meetings. This ensures
  that employees receive training on
  a timely basis.

✓ A video can be shown, and
  a test administered, at Impromptu
  meetings, such as on rainy days.
  Use the “show-up” time for which
  many companies pay wages.

✓ Show the appropriate video
  after an accident or near-miss, or to
  correct violations of ANSI Z133.1
  safety requirements.

✓ ALWAYS follow up the
  video with on-the-job training.

✓ Use our Safety Improve-
  ment Action Plan for safety policy
  enforcement (see pg. 5).

Look For These Icons:

Earn I.S.A. C.E.U.’s
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Part of the
Tree Care
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Power Equipment Safety Video Series

This three-video set fosters safe work habits for ground operations.

Chipper Use and Safety - P001
The best trained ground crews know the proper safety procedures to use when operating a chipper. Our video, Chipper Use and Safety, demonstrates the most safe and efficient methods your crew should use when operating a chipper. This video will help turn your raw, “chuck and duck” recruit into a “top gun” ground operations specialist. Includes safety procedures for both drum and disc chippers. Length - 15:14

Chain Saw Use and Safety - P003
Are your crews up to speed with the latest industry standards regarding chain saw safety? In 1994 there were 42,283 accidents involving chain saws in the United States. This video will help keep your employees from becoming part of that statistic. This video demonstrates the proper way to use chain saws while climbing, working from an aerial lift, performing take-downs, limbing, bucking and more. Making sure your crew uses the proper safety techniques is the best way to protect them and ensure yet another job well done. Length - 17:30

Electrical Hazards Video Series

This two-video set is required for completion of E.H.A.P. training (see pg. 6) or use separately to teach employees respect for electricity and its hidden dangers.

Electrical Hazards and Trees - E002, E102
Can your crew recognize an electrical hazard before it’s too late? Electricity is the most unforgiving and often the most unfamiliar hazard facing any tree worker! Unsafe acts cause 95% of all tree and wire-related accidents! This video demonstrates the proper safety precautions your employees should be using according to ANSI Z133.1. Length 23:02

Aerial Rescue - E001, E101
This may be the most important video you or one of your crew members will ever watch. The tape covers rescue equipment selection, electrical hazard rescue, personal safety during an aerial rescue and more. The section on electrical hazard rescue is extremely important for all employees to study. It demonstrates how to safely perform or assist in an electrical hazard rescue. Length 15:55

Call 800 733 2622 to place an order!
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This five-video set shows time-saving and safety-enhancing techniques for climbing, pruning and rigging.

**NAA Rigging Video Set**
This two-video set is the newest addition to the ATA video series. These videos give your personnel information on techniques and equipment that they can apply in the field. The "rigging team" is made up of Don Blair, Ken Johnson and Robert Phillips, three of the foremost rigging-for-removal experts. A "how-to" manual is included with the purchase of either video or the whole set.

**Basic Rigging - A002** builds a solid foundation of knowledge in the use of lines, knots, hitches, slings and hardware. It teaches how to evaluate the tree for potential hazards and how to match the rigging techniques to the tree for optimal efficiency.

**Advanced Rigging - A003** delves into the special challenges presented by particularly large or hard-to-get-at trees. In it you will find more extensive discussion and illustration of multiple-rope rigging, the use of lowering devices and application of slide-line techniques.

**Principles of Pruning - A004**
This art and science takes years to master. It is a core skill of our trade. This video provides invaluable lessons in proper pruning that cannot be presented by a book or other written material. The video demonstrates pruning methods, equipment selection and reasons for pruning.

Lengths:
- NAA Rigging Video Set: 2 videos
- Basic Rigging - A002: 22:00
- Advanced Rigging - A003: 22:00
- Principles of Pruning - A004: 15:25

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**Ropes, Knots, and Climbing - A005**
Want to bring your employees up to the next level in climbing? Or would you simply like to know what safety procedures ANSI Z133.1 requires during climbing operations? The NAA’s Ropes, Knots and Climbing video is just what you need! Expert tree climbers show techniques they use every day to increase safety and productivity. This video addresses appropriate elements of Z133.1, while providing clear instructions in many of the latest climbing techniques. Your workers will watch easy-to-understand demonstrations on the uses of ropes, knots, carabiners and saddles. Your crew will also see basic instructions in tying knots and basic-to-more-advanced climbing techniques.

Length: 22:00

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**The ATA video series**
**Members:**
- each video: $60.00
- set of five: $270.00

**Retail:**
- each video: $90.00
- set of five: $405.00

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The filming of an NAA video.

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**Pruning Standards and Practices for the 21st Century - A001, A101**
Are your employees using the latest industry recommendations in their pruning practices? Can your salespeople communicate in the standard language of our industry?

Watching this video will help your employees improve their pruning techniques as well as be able to communicate more clearly with crew members, other tree care professionals and your clients. This video has been produced jointly by the NAA and ISA. It teaches your employees the ANSI A300 industry standards for pruning operations.

If your company still writes pruning orders using the old NAA pruning classifications, this video will help you "get up to speed."

Length - 23:22

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Call 800 733 2622 to place an order!
NAA Video Store (cont.)

Back Injury Prevention video set.

Back Injury Prevention - V001
Back injuries are one of the leading causes of lost time in our industry. Don't let preventable injuries slow your crew and kill your profits. Posters and decals that demonstrate exercises and proper lifting techniques that prevent injuries are included. Length 30:00

Members $75.00 Retail $120.00

On Target Video Series

V002 - This video series provides the information you and your crew need to protect your client's investment. Applying pesticides to tall trees with high-pressure spray equipment is serious business. Give yourself and your employees the knowledge necessary to get maximum effectiveness with minimal wear on equipment.

Application Techniques
(Length 7:18)
Hydraulic Sprayer Operation
(Length 9:50)
Hydraulic Sprayer Calibration
(Length 11:48)

Members $135.00 Retail $210.00

NAA Safety And Training Programs

The NAA offers safety programs based on the collective experiences of our industry. These programs help your employees develop a healthy respect for the tools of our profession while learning to use proper safety procedures during tree care operations.

Tailgate Safety Program

NEW!
A tailgate safety session is a short, informative lesson given at a job site. It requires a small amount of time but is highly effective.

OSHA requires employers to provide a workplace free from recognized hazards and to provide safety training. Our Tailgate Safety Program provides an excellent method for documenting that safety training.

Our Tailgate Safety manual makes safety training easy!

The new edition of our Tailgate Safety manual features 60 sessions covering workplace scenarios likely to cause harm. Each session includes trainer instructions, handouts and quick comprehension tests. Use the test results for OSHA safety training documentation. You can upgrade your 1994 edition with 20 new Tailgate sessions!

Tailgate Safety Manual - T001 Members $105.00 Retail $165.00
Tailgate Safety Upgrade - T002 Members $35.00 Retail $45.00

Call 800 733 2622 to place an order!
Ask the NAA:

Q: What are employer-certification training programs?
A: Programs that allow the employer to certify the completion of an employee's training.

Q: What advantages does an employer-certification training program offer my employees?
A: Many! Educational materials are used with on-the-job training. Employees apply new techniques and concepts immediately!

Q: Sounds great! But do I have the time to teach all of this?
A: Actually, employer-certification training programs are easy to start. Designate a crew leader or other responsible employee to serve as program administrator.

Your employee studies our training manuals at home or during show-up times at the shop. You take a test at the end of each session. The NAA corrects the test.

Q: What advantages does this method of training provide?
A: It provides:
- credentials to demonstrate and market your company’s professionalism
- a structure for employee recognition and promotion
- a method for motivating and retaining employees
- a low cost training program

The NAA offers comprehensive E.H.A.P. training.

If a worker or tree being worked on is within 10 feet of electrical lines, an electrical hazard exists. According to ANSI Z-133.1, as well as OSHA regulations, any employee exposed to electrical hazards must have documented experience and training in working with electrical hazards.

Knowing the proper techniques to use when an electrical hazard exists is crucial for all arborists, even if the only hazards your employees face are in your client’s backyard!

The Electrical Hazards Awareness Program (E.H.A.P.) gives your employees the knowledge they need to prevent accidents while helping them become qualified line clearance tree trimmers. All arborists will find this training program valuable.

The employee studies each of the six sessions in the manual. A test is taken for each session and graded by the NAA. The results are entered in our database for tracking. Forms for employer verification of basic first aid/CPR training, completion of a practice rescue and trainee viewing of the Aerial Rescue and Electrical Hazards and Trees videos are also provided.

A hard hat decal, certificate of completion and wallet card are awarded to graduates.

To enroll an employee in E.H.A.P. training you need:

**Electrical Hazards Awareness Program manual**
Order a manual for each employee you enroll in E.H.A.P.

**Electrical Hazards and Trees and Aerial Rescue videos**
To complete E.H.A.P., employees must be shown these important videos (see page 3).

**Electrical Hazards Awareness Program renewal**
Keep your E.H.A.P. training up-to-date with a yearly renewal.

<table>
<thead>
<tr>
<th>Members:</th>
<th>Retail:</th>
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</thead>
<tbody>
<tr>
<td>E.H.A.P. manual - E003, E103</td>
<td>$85.00</td>
</tr>
<tr>
<td>E.H.A.P. renewal - E004, E104</td>
<td>$25.00</td>
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</table>

Call 800 733 2622 to place an order!
The "crown jewel" of all our training programs, TCS is reserved for NAA member companies. Tree Care Specialist is an employer-certified program that provides a structured curriculum for professional training. The TCS program consists of 28 chapters based on NAA training materials. Use of our suggested materials is recommended. However, on-the-job training or other educational materials you may already own can be substituted. The employer verifies the trainee's competence in various skills. The trainee takes a test for each chapter. The tests are corrected by the NAA and the results are entered in our database for tracking.

The 28 chapters of the TCS training program are divided into three training levels based on general job titles. The employer can use the training levels as a basis for employee recognition and promotion. The following is a list of TCS training levels and chapters with the educational materials recommended by the NAA. Call toll free, 800 733 2622, to get more information about the TCS training program or to enroll employees!

**Level 1 Tree Care Apprentice**

This is entry-level training, providing new employees with the basic safety training they need during the first few months of employment.

Prerequisite - Company must provide a tailgate safety training program to its employees.

Chapters 1 to 4 - *Professional Tree Care Safety* videos.

- Chapter 1 General Requirements
- Chapter 2 Personal Protection
- Chapter 3 Equipment Procedures
- Chapter 4 Operational Practices

**Level 2 Ground Operations Specialist**

This level provides safety and technical training to help your ground workers be safe and efficient.

Chapters 5 to 7 - *Power Equipment Safety* video series.

- Chapter 5 Chipper Use and Safety
- Chapter 6 Chain Saw Selection and Maintenance
- Chapter 7 Chain Saw Use and Safety

Chapter 8 Back Injury Prevention - video

Chapters 9 to 16 - *Home Study Manual 1*

- Chapter 9 Anatomy and Physiology of Trees
- Chapter 10 Soils
- Chapter 11 C.O.D.I.T.

- Chapter 12 Safety Practices
- Chapter 13 Pruning Part 1
- Chapter 14 Pruning Part 2
- Chapter 15 Identification and Selection of Trees
- Chapter 16 Transplanting Shade and Orn. Trees

Chapter 17 Pruning Part 3 (either NAA pruning video)

**Level 3 Tree Care Specialist**

The Tree Care Specialist training level provides advanced training for climbers, crew leaders and other employees.

Chapters 18 to 25 - *Home Study Manual 2*

- Chapter 18 Diagnosis of Ornamental Tree Problems
- Chapter 19 Non-Parasitic Injuries to Orn. Trees
- Chapter 20 Insect Problems of Ornamental Trees
- Chapter 21 Disease Problems of Ornamental Trees
- Chapter 22 Pollution Damage to Ornamental Trees
- Chapter 23 Pesticide Application Guidelines
- Chapter 24 Fertilization and Watering
- Chapter 25 Maintenance and Repair Practices

Chapter 26 Ropes, Knots, & Climbing - video

Chapter 27 Crew Leader - *Home Study Manual 3*

Chapter 28 Electrical Hazards Awareness - Completion of all requirements for E.H.A.P. training, including the videos *Electrical Hazards and Trees* and *Aerial Rescue*, is required.

Call 800 733 2622 to place an order!
The Home Study Program for Professional Arborists

Are you interested in a training program that gives an employee a basic understanding of the art and science of arboriculture? A program designed by some of the foremost academic and professional experts in arboriculture?

The Arborist's Home Study program is what you are looking for! The sessions address subjects from tree anatomy and physiology to advanced maintenance and repair techniques. After studying each session, the trainee takes a multiple choice test that is graded by the NAA. The results are entered in our database for easy and accurate proof of training.

Home Study Manual 1 - Basic Arboriculture - H001

Education starts with fundamentals. The eight sessions cover subjects such as soils, pruning, safety procedures, transplanting of shade and ornamental trees, etc. Among the expert writers for this manual are Dr. Alex Shigo, Dr. Dan Neely, Edwin Irish and William Rae.

Home Study Manual 2 - Advanced Arboriculture - H002

This manual builds on previous knowledge. The eight sessions cover subjects such as diagnosis of shade and ornamental tree problems, pesticide application guidelines, maintenance and repair techniques, etc. The expert writers for this manual include Dr. Michael Raupp, Dr. Eileen Brennan, Dr. Elton Smith, Erik H. Haupt, Tim Johnson, John Britton and Larry Holkenborg.

Home Study Manual 3 - Crew Leader - H003

Our crew leader's manual is designed to help your employees make the jump from labor to a supervisory position. It is also helpful for increasing all your employees' people skills for more effective communication with your clients.

<table>
<thead>
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<th>Members:</th>
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<tr>
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<td>manual 3</td>
<td>$85.00</td>
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<tr>
<td>set of three</td>
<td>$210.00</td>
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</table>

Should I use the Home Study and TCS programs?

Yes! The Arborist's Home Study program is designed to be used as part of TCS training.

- The sessions test scores are automatically substituted for TCS chapter test scores, so there is no need for the employee enrolled in TCS and Home Study to take two tests.

- The employee is given a manual that is also a valuable desk reference.

- It makes studying for tests easy and gives rewards upon completion of each manual.

- Employees who have already completed Home Study manuals have automatically completed the corresponding chapters in the TCS program.

Do the Home Study and TCS program offer employee rewards?

The Home Study program offers:

- A wall certificate for completion of each manual

- A wallet card for completion of each manual

Tree Care Specialist program offers:

- A helmet decal for completion of each level

- A wall certificate for completion of Level 2 and Level 3

- An arm patch and wallet card for completion of Level 3

Page 8

Call 800 733 2622 to place an order!
Manuals and Safety Products

A Climber’s Guide to Hazard Trees - M004, M104
Can your climbers recognize a tree that is too dangerous to climb? Have you had problems explaining these dangers to your Hispanic workers because of the language barrier? This pocket guide defines and illustrates common natural and man-made hazards of trees.

Spanish

THE TREEWORKER newsletter - M006
This is the monthly newsletter for the field employees of tree care companies. Each issue gives employees “How to…” pointers on various subjects, such as improving client relations and avoiding vehicular accidents. Special features such as disease and pest alerts, tree identification or technical features appear in many issues. Those often hilarious, always informative Mr. Safety cartoons, created by the tree care industry’s own Brian Kotwicka, are on the back cover! Also, the Arborist Quiz makes each issue a potential tailgate safety training session.

Guide for Plant Appraisal - M005
According to research statistics, 99% of the public value their trees. They rely on you to evaluate correctly all the engineering, architectural and environmental benefits that increase the value of trees. This guide, authored by the Council of Tree and Landscape Appraisers, defines and demonstrates the accepted methods for determining the comprehensive value of a tree.

Each booklet:
Members $20.00 Retail $25.00

A300 Pruning Pad - M003
This handy 8.5 x 11 inch pad of 50 handouts is great for teaching employees, and clients, how the A300 pruning standards are used in job estimates. A300 pruning specifications are defined and examples of pruning specifications are given.

Members $2.25 Retail $2.25

Safety Improvement Action Plan - M007
Give your employees clear goals by documenting safety violations and establishing corrective actions! These forms document your company’s enforcement of its safety policy.

See the back side of the order form for our 12-month subscription price and our volume discounts.
Manuals and Safety Products (cont.)

Hazard Tree Quick Check Decals
These visual-orientated, durable vinyl decals show field workers how to detect common tree defects. Order vertical decals, M008, for clipboards and horizontal decals, M009, for the sun visors of your company vehicles.

Members $1.00  Retail $1.50
Indicate vertical or horizontal!

Why join the NAA?
Because members receive:
- Management guidelines
- Use of registered logo
- Use of hotline
- A voice in Washington
- TCS training program
- Monthly newsletter
- Marketing materials
- Free Internet advertising
- and more!

Call the NAA at 800-733-2622 ext. 105 to learn more about NAA membership!

The Member Store

The NAA supplies an array of members only products designed to help demonstrate your dedication to professionalism!

NAA Public Relations and Sales Brochures - N001
Why pay writers, artists and printers when you have the NAA behind you? Our brochures are ready for your company name and logo. They are the easiest way to demonstrate your company's professionalism. Please inquire about our current selection of brochures.

NAA Self-stick Logo Decals - N003
New 1" x 1" self-stick labels are great for all your business forms. Our larger decals are made of durable, weatherproof vinyl so everything from your helmets to your aerial lift can sport a NAA logo.

<table>
<thead>
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<tr>
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<tr>
<td></td>
<td>500</td>
<td>$27.50</td>
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<tr>
<td></td>
<td>1000</td>
<td>$50.00</td>
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</tbody>
</table>

2" x 2.5" each decal $0.75
Add $1.20 ea. for reflector decals

6.5" x 8.5" and 9.5" x 12"

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<td>11-25</td>
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<tr>
<td>26-100</td>
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<tr>
<td>100+</td>
<td>$5.75 ea.</td>
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Add $2.50 ea. for reflector decals
Indicate decal size on order form!

Membership Plaque - N004
This handsome 8" x 10" walnut plaque with a brass engraving inset looks great on your office wall. The plaque is crafted to order so call for a price quote.

Client Recognition Plaque and Certificate
Do you have a client who shows extraordinary concern for the preservation of trees? This attractive plaque is the best way to demonstrate your appreciation to special clients. This laminated, wood plaque bears your client's name, your name as sponsor and an NAA endorsement. A handsome Client Recognition Certificate is also available. This 8" x 10" certificate has a professional appearance and is ready for framing.

Plaque - N005
Certificate - N006

|$45.00
$10.00

NAA Lapel Pins - N007
Show pride in the tree care industry!

|$10.00 ea.

Emergency Phone Number Decals - N002
An easy way to post important numbers in your company's vehicles.

|$0.50 ea.
Come to New Orleans!!

National Arborist Association’s

WINTER MANAGEMENT CONFERENCE

February 10-15, 1998

Hotel Inter-Continental

New Orleans, Louisiana

Third Annual Excellence in Arboriculture Awards

The pursuit of excellence is the lifeblood of this profession. When attained, excellence should be acknowledged, rewarded and respected. This program recognizes companies and their clients who have distinguished themselves with excellence, as shown by their work and dedication.

Hosted by NAA and funded in part by Altec Industries

For more information call toll free: 1-800-733-2622