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The Luck of the Draw
... or is it what you make of your hand?

When was the last time you played a game of Scrabble? Well, I got a new Scrabble board for Christmas, and John and I have spent quite a few hours lately strategizing how to get more points with the best words. For two people who read a lot, we’re pretty serious about this stuff. Of course, when I win, it’s because of the brilliance of my strategy in anticipating where to place the next letter and how to block him from getting those triple points. When I lose, no doubt, it has to do with the luck of the draw of which letters I got and what squares are left on the board.

I began thinking about our careers as a game of Scrabble. On the one hand, there are some variables that come into our lives that we cannot control – like which letters we get to play with – but can sure affect our careers! Think about just one consideration: whether to relocate for a new job. You would really like to go work with palm trees in Florida or Hawaii, but first you have to consider school systems for children, elderly parent issues, and maybe an established business a spouse set up. Some things we can work around by waiting for a different time in our lives or by getting additional education, but sometimes – like when you don’t get exactly the letters you were hoping for – we need to think through how we might live the life we want without moving. We consider heeding the advice of Voltaire in Candide: “Bloom where you are planted.”

Andy Grove, chairman of Intel Corp., says, “Assume any career moves you make won’t go smoothly. They won’t. But don’t look back.”

Let’s say you started out as a groundworker and were promoted to a climber. Along the way, you attended NAA and ISA seminars and garnered enough CEU’s to pass the ISA certification test – and you did it! You got your triple point word! You’re absolutely sure that you’re up for crew leader the next season, and you are sure the owner is going to buy another bucket truck and expand into a new area. This is your time. You’re psyched and ready.

But then, the economy tanks, and your boss decides this is not the time to take on more debt with that new truck. There is no room for your promotion this spring. What do you do? You can leave in disgust and try to find another crew leader job in town, or you can stay with the guy who has helped you get where you are today, ready for a new challenge, and go with the opportunity when the economy improves. It’s just like being sure you’ve got the game of Scrabble locked up – when all of a sudden, your opponent draws that letter worth 10 points and drops it on a triple point square and uses up all his letters, getting 50 extra points.

Maybe you lost this time, but there is always next time. What you do in the meantime shows what you’re made of. Think about it. You’ve indicated to your boss that you are ready to be a crew’s mentor every day by being their crew leader – and your first act when things get tough is to walk?

Instead, think about loyalty, opportunity, and the challenges you can still tackle every day. But think of them from a crew leader’s perspective. If you were leading your crew, what would you do? Is the safety training as good as it could be? Is everybody testing their equipment and wearing all of their equipment properly? What about your attitude and tone of voice? Would you speak to your crew that way? If not, what would you do differently? Use the interim delay as a chance to perfect more skills by observing what others are doing.

After all, “It’s a shallow life that doesn’t give a person a few scars,” according to Garrison Keillor, and that Scrabble hand you just drew that looks like it stinks could be a lifetime high score – depending on how you play the letters.
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TCI's mission is to engage and enlighten readers with the latest industry news and information on regulations, standards, practices, safety, innovations, products and equipment. We strive to serve as the definitive resource for commercial, residential, municipal and utility arborists, as well as for others involved in the care and maintenance of trees. The official publication of the non-profit National Arborist Association, we vow to sustain the same uncompromising standards of excellence as our members in the field, who adhere to the highest professional practices worldwide.
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All too often when arborists approach a tree, we are most interested in how quickly we can get the job done. And all too often, arborists perish when a tree collapses or some tree part fails.

No matter how much we think we know and how much experience we have, the unexpected can happen. It is often the routine jobs that cause surprises. We tend to plan fairly well when faced with enormous takedowns using cranes or other special equipment, but when we go out to tackle that 18-inch dead oak, we let our guard down. As a result, the job does not get examined closely enough and someone ends up getting hurt.

Thorough tree risk assessments should be done at every job site. When conducting a risk assessment, a number of factors must be considered. First, the definition of a hazard tree: A hazard tree is a tree with a defect and a target. Since arborists climb and work in trees, arborists are the targets. Basically, you need to accurately identify any defects that could cause the tree to fail while you are in the tree.

There are three components as to why trees fail:

1. **Force.** The typical force that we consider is the wind. Climbers also put force on a tree, either by climbing it or by lowering off of it.

2. **Tree structure.** Arborists are concerned with the ability of a tree structure to resist wind, snow, and ice. Your primary concern, however, is your weight and the force of limb lowering added to the existing weight and wind resistance of the tree.

3. **Weakness.** In order for trees to fail under normal working conditions, there needs to be an unusual weakness in the tree.

**Different levels of risk trees**

What you should be most concerned about is what we call the “weak tree” model. In this model, the tree has an extreme weakness. Structurally sound trees won’t fail when an arborist is working in them. When a tree has a major defect that overrides everything else, that is the one that will kill you.

We have broken down risk into four levels:

1. **Critical-risk trees.** Failure is imminent in these trees. The tree is going to come down very soon—whether it is under your weight, ice load, rain load or even just wind. Gravity could also pull it down. Critical-risk trees have 50 percent or more of a stem or branch decayed, or roots that have been cut within a three-times-diameter circle around the tree. Climbers should not climb these trees.

2. **High-risk trees.** Failure may occur during extreme weather, such as an ice storm, winds near hurricane force or a thunderstorm. You can usually work in high-risk trees without major concern, but differentiating between critical-risk and high-risk trees is very important.
Decay that begins in the root system can spread to the trunk, causing tree failure.

Root decay works from the tip of the root up to the trunk, and is usually on the bottom of the root. Most old trees have some degree of root decay.

Any time you come to a tree that has an abnormal swell, known as an “elephant’s foot,” there is a chance of root decay. Inspect the roots closely.

Fused roots are often a visible sign of serious root decay.

3. **Moderate-risk trees.** It takes extreme conditions – such as a tornado or hurricane – to bring these trees down. Moderate-risk trees may have some stem, branch or root decay. Lowering off of these trees is usually not a problem.

4. **Low-risk trees.** These may fail if the conditions are bad enough, but probably won’t fail in the near future.

**Symptoms**

Start your inspection at the root and soil area around the tree. When arborists walk up to a tree, the general tendency is to look up first. You need to have a systematic way of examining trees, and it is best if to examine the roots and the soil around the tree first. Go around the stem and look for defects. Finally, examine the major branches and crown. You need to do this for every tree you climb. It’s not usually the big ones that hurt and kill people; it’s the medium-sized ones – the everyday trees – that tend to become problems.

**Root and soil inspection**

What should the root and soil inspection consist of? First you need to see the buttress roots – the major roots that support the tree. Virtually every hardwood tree species will have buttress roots.

Next, look at the site to see if there is any evidence of recent cutting of roots or missing roots. Often if a root was cut a number of years ago, there won’t be any sign of the trench, but there may be root decay. Look for missing roots and root cuts.

Other things to look for include a root characteristic we call “elephant’s foot” because it swells out abnormally. Any time you come to a tree that has an abnormal swell, look at that tree more carefully. Fused roots are another red flag. We quite often see serious root decay with fused roots.

When it comes to root failures, two types are of concern. One is indeed a root failure, which is when the root system breaks. From a climber’s perspective, it is the most serious condition. The other situation is soil failure.

With root failure, the root system is decayed and that decay often works into the trunk. Thus, the trunk can break due to root decay. Soil failures, on the other hand, usually aren’t as critical from a climber’s perspective because we are quite often not out there during the heavy storms where saturated soils are a leading cause in failures. In addition, soil failures are very hard to predict.

Next, look for cracks in the soil. This could indicate that the tree is moving more than normal. Cracks above buttress roots could be an indication of danger – especially on the side of the tree opposite the cracks. When the tree starts leaning excessively, it is lifting up that buttress root.

Fungal fruiting structures are a real key to decay. They might not be obvious, since they could be dried up. This is one of the major factors that we find in many accidents: the tree was seriously decayed, and the decay was not visible. This symptom of root rot might not be obvious. Fruiting structures are generally short-lived, lasting up to a month; they might show up here and there, and later on in the season could disappear.

Examine the base of the tree. If you are in the business of climbing, you have to see the base of a tree before you go up into it. If
the base is buried or hidden by vegetation, clear it away to make sure the trunk is sound and the root collar is not buried. A buried root collar is a major indicator of a weakened tree. Trees might put out adventitious roots to compensate, but those roots rarely compensate for the holding ability of the buttress root system.

**Root cuts**

We also have to be concerned about root cuts. Root cuts occur in the urban environment fairly frequently. Our general rule of thumb for root cuts is that if you have to make them, make them out of the drip line. That will have virtually no impact on the tree. If we are making a one-sided root cut—that is, cutting roots on just one side of the tree—as long as we are out about five times the DBH away, there should not be a major impact on tree stability nor on its long-term health. At that distance, we are cutting more lateral roots than buttress roots. With lateral roots, the tree can close wounds and regenerate.

If you need to cut closer to the tree, the minimum distance should be about three times the DBH away from the trunk. If you have a 3-foot diameter tree, you need to make that cut about 9 feet from the trunk. This point is about at the end of the buttress root system; therefore, impact on stability is going to be minimal if you are cutting on just one side of the tree. The long-term impact on decay is not known.

If the cut is inside of that three-times-diameter distance, then we are looking at a much higher risk of failure, especially on a tree with a freshly cut root system. We have all seen people trenching way too close and not showing any concern for the root system of the tree. Look for recent trenches or cuts before going up into the tree.

**Root decay vs. trunk decay**

Root decay works quite a bit differently than trunk decay. Root decay typically works from the tips of the roots—the fine roots—and then up toward the trunk, and it is usually found at the bottom of the roots. Root decay is in the area of the root that is hardest to see and hardest to detect. We then get that unlucky climber who brings the tree down.

How do we inspect for this kind of decay? Besides the visual inspection, take a mallet and bang on that tree. If it is severely decayed, you can probably hear the hollowness. Also, probe with a very small diameter drill bit. By probing, you can determine exactly how much decay is in the root system. We then take the numbers and put them to work for us.

When you walk up to a tree without a root flare you don’t know what is going on under the ground. Often a decayed tree will have a healthy green crown. No root flare should serve as an alert to the arborist: If the root system isn’t there, how can you inspect it?

**Trunk inspections**

Our next area of examination is the trunk. Here we have a number of factors to look for. Cracks and seams are major issues—especially the cracks. Again, look for cavities and decay, loose or dead bark that may indicate dead areas on the trunk,
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root decay or something else happening with the root system. Fungal fruiting structures are a good indication that decay is present.

A small crack or seam in the trunk probably isn’t a real big problem. It may be a frost crack that opens and closes yearly. It is hard to say where it came from. But an active crack that is moving – if it is associated with decay or if the crack goes all the way through the trunk – could mean that the tree is coming down. It often takes a couple days for the tree to come down when the cracks are active, or it may take a little bit more wind. When we see those types of cracks – especially when it is associated with decay – that tree is in the process of failing, and it should not be climbed or lowered from.

Next, look for co-dominant stems. We know this is a weak area. Professor Ed Gilman has done some work looking at branch angle, or the ratio of branch size to trunk size. Basically what he found is that the smaller the branch when compared with the stem, the stronger it is. When you see an equal-size situation, the stem is fairly weak. In our laboratory, we are looking at trees with included bark and those without. We are finding that included bark co-dominants are a little bit weaker. Anytime we have a co-dominant stem situation, we have a weaker situation. Add a little decay, and it’s a recipe for disaster.

This brings us again to the topic of decay. Sometimes decay is obvious and sometimes not. If we have an opening to the outside, decay is confirmed and it is then only a matter of determining how much sound wood we have and how much decay is present.

We all know how decay works in trees. It starts with a wound and the tree responds to that wound. As decay moves in, it will move up and down and then in toward the center. The new wood produced outside of the decay is the most decay resistant. Unlike roots, we have a pretty well defined area where the trunk decay is, and we can find the diameter.

Sound, or bang, the trunks, listening for hollowness. If it is extremely hollow, you will usually be able to hear that, and you should probe that tree. When sounding, start at the root collar and work your way up the trunk. If you hear hollowness, take out the drill or one of the many decay detection devices available on the market and probe for decay.

How do you interpret this information? Use a chart to help you out. High-risk trees are basically diameter times .15, which is the same as radius times .3 (the equation used by Dr. Claus Mattheck). In this country we don’t have radius tapes, we have diameter tapes so it works better for us to do it on a diameter basis. For the critical risk trees, the trees that we would not climb, take that diameter number with no opening and multiply it by .1. For instance, if we have a 30-inch tree, we would say it is a high risk if there is less than 4½ inches of sound wood around the exterior of that tree. If there is less than 3 inches of wood, you should not climb that tree. Those numbers vary depending on the opening to the outside. Obviously if we have a cavity opening, we have to reduce those numbers, increasing the amount of sound wood required.
Crown inspection

We have looked at the roots and the trunk; now we need to work our way up and look at the crown.

Dead branches and hangers in a crown can pose a risk, as can abrupt bends, such as where a tree was previously topped.

Cracks in the crown really don't get enough attention. When we have a crack in a limb, it often comes from overloading on one side. A tree will have compression on one side and tension on the other side, resulting in a crack forming along a neutral plane between the tension and compression. These cracks often lead to a drying of the wood, making it more fragile and much more likely to fail.

As elsewhere in the tree, decay in the crown is also something to look for. Cables are certainly a risk factor. Also, previous limb failures need to be questioned. Does the tree have a history of dropping its limbs? If so, can you tell why?

Branch defects can cause a failure at any time. Abrupt bends tend to be very poorly attached and they probably have decay moving in wherever the branches were broken or topped. Also, pause to consider the tree's history of failure. When you have a tree that you can see major branches have come off, there is an excellent chance that another branch will come off, too. If you can't tell why, then be very careful.

Look at the architecture of the tree. An off-center crown with all the weight on one side and lean to it is a problem. If decay is also present in the trunk, the tree should not be climbed. Look at the live crown ratio also. When less than one-third of the tree is in foliage, that tree becomes a higher risk.

Arborists have become very proficient at putting a line 65 feet up a tree with a throw bag. But you can't really see what you're tied into. You could have a sucker in play, or more importantly, you could...
Parts of a Tree to Inspect

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CROWN

STEM

Root flare

Root collar

Root plate

Branch union

Branch

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Ergonomics update

Like other industry and labor groups, the National Arborist Association has little idea of what to expect should the Labor Department come out with ergonomics guidelines for employers.

The National Association of Manufacturers, the largest industry group to actively fight promulgation of an Ergonomics Standard over one year ago, has publicly acknowledged they would have to look at them before taking a position.

Some Washington insiders predicted that the long-awaited announcement would come as early as the week of Jan. 13. Officials at the Labor Department have recently said that the announcement would come “soon” but could not supply a date.

After Congress overturned DOL’s ergonomics standard in March 2001, Labor Secretary Elaine Chao promised to release a plan by September 2001 that would outline how the agency would address musculoskeletal disorders in the workplace. The agency was diverted by the attacks of Sept. 11, and postponed the announcement until later in the fall. The department has yet to make an announcement, which has prompted five senators to urge Chao to make her plan known.

Recordkeeping reminder

Simpler, easier to follow requirements for tracking workplace injuries and illnesses are now in force for 1.4 million employers covered by OSHA’s new recordkeeping rule. If your firm employs more than 10 full-time workers, then this rule applies.

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For small businesses, the term “growth” classically involves more locations, products, services, office space and correspondingly increased expenditures. Why not broaden our definition of growth? Not all growth has to be physical or financial. Growth can also involve an enrichment of the business through the acquisition of resources that might not necessarily be physical or financial. An increase in skills, training, or education enriches the business and can be considered a form of growth.

Let’s consider various resources that can improve or enhance your business.

Professional resources

One of the best resources for a business is its professional associations and connections. This is also one of the most underutilized. These resources include a trade association – such as the National Arborist Association – local business groups, neighborhood groups, service groups, and other affiliations. But to make use of them and to get anything from them requires participation. Just belonging isn’t enough. Time is the big expenditure here, and an obvious consideration. All of us have limited social energy and time. For an affiliation to truly be a business resource, participants need to get business-related benefits.

If the monthly Chamber of Commerce lunch is good and you have a good time with friends, that’s nice, but it’s not an outside resource for the business. If the programs focus on more effective ways of doing business, or proposed strategies for improving the local business climate, or how to shop more effectively for insurance, for example, it can be a valuable resource.

Networking

This was a hot business topic several years ago; then it went out of style. But it’s still an important resource if used well. Most of what passes for networking is something else – socializing, schmoozing, and swapping business stories. Many casual exchanges can be useful, but effective networking tends to be more carefully defined.

Effective networking groups are organized almost as a league, with members. The key is that each member must have something to offer, and many networks consider their balance of members very carefully. This doesn’t mean you have to have top experts in law, accounting, management, community relations, communications, etc. Some “members” come with no such credentials, but they’re often the people who make the network a success through personality, creativity, or a willingness to seek out help for members.

Some networks meet regularly, and in effect become a forum for ideas and problem solving. Others operate simply as a reference/resource group, with few or no plans for meeting.

Board of Directors

Too often boards are a matter of family relationships or friendships. That’s not the best basis for selecting members of a board. Far more effective is to choose a board with a range of expertise. Of course, good friends and family members can have expertise, but it’s best to maintain a balance with some outsiders.

Utilizing a board of directors effectively can be a matter of balance. Problems can arise when a working board is over-utilized. Management needs to be scrupulous about calling on the “free” expertise too often.

New blood

A friend of mine who is a pretty canny investor and specializes in small – often new – businesses never invests in a company where the last names are all the same. Like most such absolutes, that one doesn’t always stand. But his point is well taken. Most businesses – and not just family firms – at some point can use some new blood. An “outsider,” if you like. At some point if the business is to grow, it becomes physically impossible for one person to do everything.

“Family” as used here doesn’t necessarily mean relatives. The idea of new
blood applies as well to employees who have been with the business a long time. These employees are immensely valuable for their knowledge and ability, and their contribution is not to be played down in any way. But there’s nothing like “new blood” for infusing new ideas, energy, creativity and different abilities into the mix.

Obviously, a tight economy isn’t the time to be creating jobs. (This is rarely a good idea in any economy. Jobs should come about from an identified need.) For many businesses the opportunity for this new infusion comes when an employee who has been with the business a long time leaves. Too often, however, the business seeks a replacement in every sense of the word. They look for someone as close to a clone as possible. This isn’t a bad policy per se, but it misses an opportunity. Perhaps a better approach is along the lines of “We need someone whose job skills involve X, Y and Z. But maybe we can find someone who comes at the job from a different approach, or someone who is willing to look beyond the boundaries of the job description.”

Of course, having promised a candidate these sorts of opportunities, management has to see about providing the setting for doing just those sorts of things. This may mean a significant change in the business culture. Other employees may welcome such an opportunity themselves. If management is feeling some stagnation, chances are employees are as well. Boredom is never a productive cultural setting.

In tight financial times when the economic future is uncertain, classic business wisdom advises tightening up financially and avoiding risky changes. Business as usual – but business that’s run more efficiently, productively and more economically – is the preferred mode.

All that is true. But this is also the time to explore change, to become more creative at identifying and marshaling resources. The pitfall in “business as usual” is that it might imply that inertia is all right. Too much “business as usual” can lead to stagnation.

Not all change is physical. Change can be internal; it can take place in the inner workings of the business, in the mindset underlying the business. Customers will notice that something is different – they might not be able to identify just what that is – but they will notice a change. If that change enhances the resources of the business and motivates employees, customers will respond positively.

Just as most problems aren’t solved by throwing money at them, so it is with change. Not all change is achieved by spending money. Change, like the resolution of a problem, is most effectively achieved by creative solutions.

Mary McVicker was a tax attorney before leaving to teach and write. She has been a small-business consultant in Brookfield, Ill., for more than 18 years.

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February 9, 2002
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Annual Tree Conference
Hofstra University
Hempstead, NY
Contact: LIAA Office, (516) 454-6550

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Columbus, Ohio
Contact: Ohio Chapter ISA (216) 381-1740

February 12, 2002
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University of Massachusetts
Amherst, Mass.
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February 12-17, 2002
National Arborist Association
Winter Management Conference
Ritz-Carlton Kapalua
Maui, Hawaii
Contact: Carol Crossland, (800) 733-2622; crossland@natlarb.com

February 15, 2002
Western States Palm Conference
College of Extended Learning at California State University
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Arcadia, CA 91007
Contact: Karen Yates, (909) 880-5977, fax: (909) 880-7065

February 19-20, 2002
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Wilbur Wright College
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Contact: Lois Tennant, 1-800-847-3651, Ext. 240

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Contact: Ron Cornwell, (618) 692-9434 or visit web.extension.uiuc.edu/edwardsvillecenter/2002SIGMSinformation.htm

February 20-22, 2002
ISAO 54th Annual Conference
and Trade Show
Clearly International Centre
Windsor, Ontario, Canada
Contact: (519) 373-1882

February 20-22, 2002
Landscape Contractors Association
Winter Workshop 2002 "Grow in Winter"
Bethesda Marriott
Bethesda, Md.
Contact: Laura Lloyd-Henry, (301) 948-0810, fax (301) 990-9771, e-mail lhenry@mgntsol.com

February 21-22, 2002
Al Shigo
"Tree Biology Magnified"
Portsmouth Elks Banquet Hall
Portsmouth, NH
Contact: 1-800-841-2498

February 25-March 1, 2002
ACRT
Basic Arborist
2545 Bailey Road
Cuyahoga Falls, OH 44221
Contact: Lois Tennant, 1-800-847-3541

February 26-28, 2002
Western Pa. Turf Conference & Trade Show
Pittsburgh ExpoMart/Radisson Hotel
Monroeville, PA 15146
Contact: R. Eric Oesterling, (724) 837-1402 or e-mail reo1@psu.edu or Thomas Bettle, (412) 257-2313 or e-mail tbettle@stargate.net

February 26 - March 1, 2002
American Society of Consulting Arborists Consulting Academy
Doubledtree O'Hare Hotel Rosemont, Ill.
Contact: (301) 947-0483 or www.asca-consultants.org

March 1, 2002
UMass Extention, NE Wildflower Association, Ecological Landscaping Association
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"Local Actions, Global Effects: Linking the Managed Landscape w/the Natural Environment"
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Contact: Kathleen Carroll, (413) 545-0895 or visit www.umassgreeninfo.org

March 6-7, 2002
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Trade Show & Convention
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Novi, MI
Contact: Diane Andrews, (248) 646-4952 or visit www.landscape.org

March 9-12, 2002
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Tanaka Introduces EPA 2005 Compliant Engine

Tanaka Power Equipment based in Auburn, Wash., has introduced a 2-cycle engine to meet the EPA’s 2005 emission regulations and C.A.R.B.’s Tier III standards. The PureFire engine aims to ensure the continued availability of 2-cycle products to the outdoor power equipment industry.

The 250PF engine family will include a grass trimmer/brush cutter, edger, pole hedgetrimmer, and pruning saw, with more models to follow. The 24 cc, 1.2hp 2-cycle engine reduces emissions and is fuel-efficient.

For more information, visit www.tanaka-usa.com.

New Wood-Mizer Center opens in Maine

Wood-Mizer Products Inc. is expanding internationally to establish up to a dozen new sales and services centers across North America over the next several years. As part of this effort, the firm opened its sixth North American sales and service center in November. The new center, located in Chesterville, Maine, will be managed by Ross Clair, a longtime Wood-Mizer owner and operator.

Chesterville was selected for early inclusion in the expansion program because the portable band sawmill has been popular in Northeast lumber market.

According to Mike Eastwood, vice president of Sales for Wood-Mizer, projected continued growth in the wood processing sector prompted the expansion.

Husqvarna Aligns with Sears to Add Channels

Husqvarna announced recently that it has formed a relationship with Sears to offer a limited line of forest, lawn and garden products in select locations beginning first quarter 2002.

“The professional user is our company’s primary focus. We have made significant investments in the development of professional products, and our power retailers are the best channels of distribution for the professional user. However, brand-conscious consumers also represent a large opportunity for us,” said Dave Zerfoss, president of Husqvarna North America.

National retailers have demonstrated an ability to reach homeowners by using billion-dollar advertising budgets, convenient locations and seven-day-a-week shopping hours. “Husqvarna Total Source retailers who carry a full line of products will benefit from significantly increased brand exposure,” added Zerfoss.

Husqvarna’s full line of professional outdoor power equipment will be available only through Husqvarna’s Total Source Retailers. Sears will offer a limited line of handheld equipment in 1,000 locations across the country.
SePRO Corp. completed its purchase of the worldwide rights of flurprimidol plant growth regulator from Dow AgroSciences LLC. Flurprimidol is used to reduce unwanted plant growth while enhancing the quality of ornamentals, trees, turfgrass and certain specialty food crops.

Flurprimidol is marketed in a number of countries under the trademarks Topilor, Cutless and Greenfield. SePRO will assume all rights, data, registrations and trademarks associated with flurprimidol. During a transitional period, Dow AgroSciences Europe will continue to market Topilor in Europe, through an exclusive supply agreement with SePRO.

According to Roger Slorcy, director of Global Business Development for SePRO, "The addition of flurprimidol will be complementary to our existing plant growth regulator business and provide growth opportunities in the United States and globally."

SePRO provides products and services that manage aquatic plant problems. SePRO offers a full line of aquatic products and services, including Sonar aquatic herbicide.

In addition to its aquatic business, SePRO has a growing line of products that are used to enhance the quality of ornamental horticulture crops. SePRO is the worldwide manufacturer and marketer of A-Rest plant growth regulator and Pipron fungicide.

Job Corps Urban Forestry Training in Vermont

ACRT is opening an urban forestry training program at Northlands Job Corps facility in Vergennes, Vt. This is the fifth Job Corps urban forestry training program ACRT is conducting.

ACRT started the first program to prepare entry-level tree care employees in 1993 at the Job Corps facility in Golconda, Ill. Since then, ACRT has added urban forestry programs in Pine Knot, Ky.; at the Angel Job Corps in Yachats, Ore.; and at the Ouachita Job Corps facility in Royal, Ark.

Job Corps training is year-round. It takes most students six to nine months to complete the program. Students graduate after successfully completing proficiency testing in each subject area, and ACRT assists them in their search for a job.

The Department of Labor, through the Job Corps, houses, feeds, clothes, provides medical and dental services, and conducts General Education Training (GED) training for the 17- to 24-year-old trainees. ACRT provides vocational training in climbing with rope and saddle, chain saw operation, proper pruning procedures, rigging and removal, tree identification, safety, bucket truck operation and other skills.

Employers interested in more information about hiring Job Corps graduates, or placing students in a Job Corps program, can call ACRT’s placement coordinator Barbara Brown at 1-877-652-1305 or e-mail her at treejobs@shawneelink.com.

For more information on bringing the urban forestry program to your local Job Corps center, call Lynn Kindsvatter at 1-800-847-3541, Ext. 211, e-mail lynnk@acrtinc.com or fax (330) 945-7200.

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Bad Boy Tree Saw
The Bad Boy Tree Saw is a front-load attachment that transforms skid loaders and tractors into tree cutting and removal machines. Its 8-foot saw arm can bring down trees of any size and makes its cuts flush to the ground. The high-carbon steel teeth of the saw are designed for easy cutting without binding and are put into action with the forward and reverse movement of the power unit. The Bad Boy requires no hydraulics to operate and has an optional 3-gallon spraying attachment that allows the operator to treat the newly sawed stump without leaving the machinery. For more information, contact Second Look at (785) 647-5454 or www.secondlookinc.com.

Jonsered 2159 Turbo Saw
The new 2159 Turbo gives Jonsered its first mid-range (3.5-4.0 cubic inch) pro saw in years. The 59 cc saw's performance characteristics are fast chain speed and power at high rpm. It develops 4.1 hp and has a maximum no-load rpm of 13,800. Powerhead weight (less bar & chain) is 12.3 pounds. The 2159 also has a magnesium-alloy crankcase and a new fuel compensation system that maintains correct fuel/air ratio. Features include a compression-release valve, side-access chain tensioner and a combined start/choke control. For more information, call Tilton Equipment at 1-877-693-7729.

WedgeChek with Tight-Hold Barbs
The new WedgeChek maximizes chemical retention when using the ArborSystem's Wedge tree injection system. The new device aims to improve sealing. The hard outer shell features Tight-Hold barbs that grip tree bark, holding the WedgeChek tightly in place and helping to eliminate pop-outs. In addition, the new WedgeChek works like a basketball valve: As the needle is withdrawn from tree, the soft inner core seals virtually eliminating pop-outs. For more information, contact ArborSystems, LLC at 1-800-698-4641 or www.arborsystemsllc.com.

Gandy Poly-Stainless Steel Fertilizer Hopper
Gandy has introduced a row applicator designed for metering dry fertilizer at a wide range of rates, making it ideal for small planters, nursery applications and other specialized and general uses. If ground-driven, the unit uses speed compensation to maintain a uniform rate as application speed varies. However, it can also be driven by 12-volt electric motor, governing one or two hoppers. The translucent polyethylene hopper has 2.3 cubic foot capacity, holding approx. 150 pounds, with a stainless steel housing for the nylon metering wheel system. Options include one to four outlets plus two different metering wheels to provide two rate ranges. Rates are adjusted by a set of 12 sprockets that may govern multiple hoppers, with a heavy duty drive sprocket mounting option available for ground-driven installations. For more information, contact Gandy at Gandy Company, 528 Gandrud Rd., Owatonna, MN 55060, call 1-800-443-2476, visit www.gandy.net or e-mail custsrv@gandy.net.

Sherrill Arborist Supply proudly announces the completion of a completely Spanish version of their wtsherrill.com Web site. "Arboristería de Sherrill en linea" is an exact duplicate of the English version of Sherrill Online with all of the articles, products and informative text translated. You can get to the Spanish Web site by following a link at www.wtsherrill.com or you can reach Sherrill Arborist Supply by phone at 1-800-525-8873 and receive help in either English or Spanish.

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Flexible Packaging from Growth Products

Growth Products is offering five of its products in one-quart containers. The solutions contained in the new packaging make up a program for a wide range of plant materials. The line is created for use by landscapers, lawn care professionals, smaller greenhouses and nurseries, and garden centers. Directions are included on the containers. Products in the line include Companion microbial inoculant, Essential Plus biostimulant and soil conditioner, 18-3-6 fertilizer, Triple Ten (10-10-10) fertilizer, and Organic Iron 5 percent. The point of purchase (POP) display system is also available. For more information, contact Growth Products, Ltd. at 1-800-648-7626, fax (914) 428-2780, visit www.growthproducts.com or e-mail info@growthproducts.com.

Swinger Model 2000

Swinger Model 2000 articulated compact loader/carrier now features a 65 hp Cummins 3.3 diesel engine as standard equipment. The naturally aspirated engine represents a 13 percent horsepower increase over the prior engine. Additional features include high fuel economy, reduced engine noise levels, and a two-year/2,000 hour warranty. Also new for the Swinger 2000 is a modular, side-by-side split radiator designed for efficient cooling of both hydraulic fluid and engine coolant. For more information, contact Swinger Loader Division of NMC-Wollard Inc., at 2021 Traux Blvd., Eau Claire, WI 54703, call 1-800-656-6867, fax (715) 833-8708, visit www.nmc-wollard.com or e-mail loaders@nmc-wollard.com.

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Just when you thought there was enough conflicting information out there, we now have one more issue to debate: Which is better for trees, static or dynamic cabling systems? Static line cables follow the traditional path of steel materials. Dynamic systems utilize a fabric, typically polypropylene. Dynamic cabling is commonly referred to as Cobra cable because the manufacturer of Cobra dominates the U.S. market; it is similar in how tissues are often called Kleenex.

Arborists like steel cables because they are tried and true, they last a long time, the materials are reasonably priced, and they work.

Arborists like fabric cables because there is no drilling into the tree, no tools are required, installing them is easy to learn, and they work.

So what's the problem? Why can't arborists just use what they like? Well, there are downsides to both systems that arborists need to consider. When you use steel cables, you wound the tree, leaving an opening for infection. In addition, with steel cables, the tree's sway is restricted and the tree is weakened. When you use polypropylene cables, there is potential for photo-degradation: the material seems to stretch over time; you have to employ routine inspections more often; and some say the material is not as aesthetically appealing.

There is no doubt that steel cables have been the backbone of tree support systems for many decades. When was the last time you had an emergency to repair a tree due to a cable failing? It certainly happens around the nation every year, but if you compare it to the number of trees that would have failed anyway, it is easy to argue that the benefits of steel cabling easily outweigh the negatives.

The new dynamic cables, on the other hand, take tree support systems to a new level. No tools besides a knife and a lighter are needed. The Cobra system gear weighs less than a rope and saddle and it's so simple to install, the person estimating the job - if they have climbing skills - can install a cable on the spot. This makes a tree company more efficient and only adds to the bottom line.

Metal cabling gear requires tools and materials that weigh so much that a separate tree crew is necessary, preferably with a bucket truck.

The Cobra system uses a hollow polypropylene rope that stretches when the wind blows. The rope is wrapped around the stem with a splice and the wrap is capable of expanding as the tree grows in diameter. One of the best features of the Cobra system is setting cable tension. With static cables, it can be difficult to decide on proper tension of the cable due to weight of the leaves or different stress loads caused by swirling winds.

Because dynamic cables flex in the wind, once the cable is installed properly, the right slack is achieved. Two drawbacks to fabric cables are that after many years the tree may outgrow the cable's ability to meet continued stem expansion or the cable can photo-degrade so much that it loses strength. In order to get past these negative aspects, better long-term data is necessary for arborists to feel confident installing dynamic cables in a greater percentage of their work.

Here is what experienced climbers,
Managers, and scientists have to say about the two systems:

More data first, new cable later

The Bartlett Tree Research Lab has been studying dynamic cables for four years. They have heard all the arguments, but before they make a switch from static cables they want to see results. They have been testing for strength and photo degradation.

"We have been using static cables for 90 years," notes Bruce Fraedrich, vice president of research at Bartlett. "We don’t see cables or parts of trees failing where we have installed a cable. We need to see some benefit of dynamic cables, and we are reluctant to switch if we don’t see a benefit." In regards to photo degradation, their research shows that it is a little early to make a decision, since the fabric stretches as well over time.

Fraedrich is not completely opposed to dynamic cables. There are times when fabric cables can work better than steel cables, Fraedrich says, but with regard to using them as a common practice, he wants to see more data first. There are two situations where he recognizes the use of dynamic cables. One is when you have a fast-growing young tree in which you want to see more limb movement so as not to deter the taper of the limb. The other is when a limb is no longer strong enough to hold a bolt. In this situation, a wrap-around fabric would work better. However, it is vital to note that in such a situation, the tree should only be cabled if there is no possibility of human interaction with the tree. If a limb is so unstable that it cannot handle a bolt, and there are people around, then that limb should come out.

Fraedrich’s final thought on the whole issue is summed up in a sentence: "We are open minded in theory and principle to dynamic cables, but we need to see more data."

Keep the trees wound-free

On the other side of the issue is Tom Dunlap, owner of Canopy Tree Care in Minneapolis, Minn. He has served on the ISA Best Management Practices Committee for tree support systems. Canopy installs more than 100 dynamic cables a year.

"The biggest reason we use dynamic cables is [so that] we are not wounding the tree," stresses Dunlap. "By allowing trees to swing, you build up reaction wood, which increases the strength of the stem. It is also much quicker to install, probably one-quarter of the time." The Cobra system is also not as aesthetically pleasing to some, but Dunlap counters that even though it is more visible, "People would rather see a cable than a broken branch."

Dunlap installed the first Cobra cable in Minnesota into a tree in his own back yard. When it is windy, he only has to look at the sway in the tree to convince him that dynamic cables are the way to go. The tree sways to its own natural rhythm, and when he sees that, he knows he is doing the right thing.

Another proponent of the Cobra system is Tobe Sherrill, owner of Sherrill Arborist Supply. On his Web page, Sherrill says this about Cobra systems: "... it's not the light wind days that pro-

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<td>16&quot; chain loop for mini Echo, Poulan, Husky (56 drive links)</td>
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pose the risk but indeed provide exercise for bad weather, and you don’t eliminate the tree’s ability to ‘flex its muscles’ by tightly installing systems that literally become the support. Insist on periodic pruning. For over 50 years arborists in America have employed steel wire as the preferred material for cabling trees. Steel wire is indeed strong and long-lasting, but is poorly suited for a situation experiencing such high energy.”

Sherrill also draws a parallel to “the discovery by skyscraper engineers in earthquake-prone parts of the world that providing flexibility doesn’t weaken a building but indeed strengthens it. Stiffening the canopy of a tree eventually strengthens the trunk, not the crotch.”

Sherrill makes one other very persuasive argument: “Had the USA started with Cobra cable years ago, I believe it would be difficult to convince arborists that steel should be used in as many occurrences as it is.”

The cost for Cobra cable at one time was an issue, but lately the price gap between steel and fabric systems has been narrowing. According to Sherrill, the cost for a 15-foot steel cable is $36.90; a Cobra cable of the same price rings up at $38.66.

The best of both worlds

Two people with more middle-of-the-road opinions are Sharon Lilly, director of publications with the ISA and Bill Graham, the arboricultural consultant and educator at the Morris Arboretum.

Graham teaches cabling at the arboretum. “Up till now, we’ve employed one-size-fits-all cabling systems,” he explains. “Now a new system comes along and it is important to identify when is the appropriate place for using it.” Graham believes that steel is the choice for trees with equal stems or trees that have weak crotches. He thinks Cobra works better in trees where the stems are uneven in size.

What does ANSI A300 Part 3 Tree Support Systems say about steel and synthetic-fiber cables?

The standard defines a cable as being either metallic (steel) or synthetic-fiber. It includes synthetic-fiber systems as a method of cabling, but not as a method of bracing.

Here’s some definitions from ANSI A300 Part 3:

33.6 bracing: The installation of lag-thread screw or threaded-steel rods in limbs, leaders, or trunks to provide supplemental support.

33.7 cable: 1) Zinc-coated strand per ASTM A-475 for dead-end grip applications. 2) Wire rope or strand for general applications. 3) Synthetic-fiber rope or synthetic-fiber webbing for general applications.

33.8 cabling: The installation of a steel wire rope, steel strand, or synthetic-fiber system within a tree between limbs or leaders to limit movement and provide supplemental support.

This definition means that synthetic cables are required to meet the same general requirements as are metallic cables, however the standard does go on to require installation practices for synthetic cables to follow the manufacturer’s instructions.

You can order a copy of ANSI A300 Part 3 Tree Support Systems from the NAA by calling 1-800-733-2622 or order online at www.natlarb.com.
In such cases, wind can blow the stems in dramatically opposite directions. The Cobra system would forgive more and reduce the pressure a large limb would have on a small one. In the wind, static cables on uneven stems can put a significant pressure on the smaller stem. Graham also sees Cobra effective as a stopgap if you need time deciding what to do with a problem limb.

Lilly also likes both systems and stresses their individual usage in the right place. “We need to see more research, but in theory, there are advantages to the new system,” she says. One thing is for sure: “You don’t want dynamic cables if you have a split crotch.”

She bases her opinion on technical knowledge and experience in the field. According to Lilly, “There may be some advantages to allowing more movement in the branches of a tree. Trees compensate for the forces and loads to which they are exposed by allocating resources to build tissue. When we install cables, they become part of the whole tree’s systems and can affect the way trees put on new tissue.”

In other words, a static cable might hold a tree together, but it also sends a message to the tree that it doesn’t have to allocate resources to a weak fork.

**So, how do you handle change?**

The debate between systems is similar to how people treat change. Some people see new technology and embrace it, while others take a more conservative approach and wait till research confirms the new system. If, over time, the dynamic cables hold up and are more beneficial to the tree, then the people who have installed them will know they were on the cutting edge of great tree care. If, instead, over time the fabric cables breakdown, stretch out, or require too many return trips for inspection and change, then the arborists installing static line cables will feel vindicated.

So this article doesn’t really answer a thing. Nevertheless, each person quoted here is a tree expert and each has years of experience. Chances are, if you use either system in the right situation and install it correctly, you will be fine.

Outside of that, we’ll all have to keep waiting while the research comes in.

*Michael Roche is the owner of Stowe Tree & Landscape in Stowe, Vt.*
A Lion's Tale –
A Photo Essay

By David Schwartz

In 1969, I dropped out of college as a psychology major and ended up in Boonville, Mo., where I got a job as a tree climber. (I tell people that the study of psychology drove me to tree climbing. Sometimes it gets a couple laughs!) I quickly fell in love with this addictive and challenging profession. I love working outside with nature, I enjoy the physical challenges, and I am intrigued by the investigation necessary to properly manage a plant or property.

Today, I run my own tree care business in Rhode Island – a state with no real standards for arborist licensing. Between 80 and 90 percent of the tree work I see around me is by any standard plant damage. Proper pruning should be removal of liabilities. My company is very careful to make proper cuts and not remove more foliage than the tree can afford to lose; many “tree care” companies I see working around me don’t adhere to these same standards, and many customers who buy their services are unsuspecting.

As a result of this lack of awareness about proper tree care, I started compiling slides and organized slide shows that I now present to garden clubs, horticulture classes, industry groups, etc. Here is one such presentation – a photo essay I call, “A Lion’s Tale.”

We start with an example of proper tree care ...

Photo 1: A Norway maple (Acer platanoides) before trim.

Photo 2: The same Norway maple after a trim. Our goal was to make the tree look like it has never been touched, and has grown perfectly in a natural way.
... and an example of poor tree care.

Photo 3: A poorly trimmed elm tree.

Photo 4: This photo shows the effect that a prior trim had on this elm. The loss of apical dominance and removal of too much foliage has turned this once-healthy tree into a big fuzzball! You will also notice that the left trunk now bears a marked resemblance to Big Bird.

We now get to the ‘Lion’s Tale.’

Photo 5: A Norway maple after trim. This tree has had about 70 percent of its foliage removed. The damaging factor here is that the tree has had its food production reduced by 70 percent and now has much less energy to perform its vital functions.

Photo 6: This shows the tree three to five years later. You will note that the top of the tree is getting chlorotic, while the epicormic sucker growth has become the only growth that is efficiently photosynthesizing. In other words, the tree has shifted systems to accommodate its damaged economic systems.

Photo 7: You can see vigorous suckers; in addition, the bark is beginning to split.
Photo 8: In addition to the previous detriments, the bark is starting to turn black and die in spots.

Photo 9: This is interesting if you take note of the branch on the lower left. Early April, a few years ago, we had an ice storm...

Photo 10: ... This photo shows what happened to that same branch as a result of the added weight of snow and ice from the storm.

Photo 11: This shows that the damage is continuing and escalating, as a 12-inch leader falls from the front of the tree. The tree is literally falling apart from the lion's tailing that was done years earlier.
Photos 13 and 14:
These photos show the tree's reaction to the repeated trauma. This tree will soon be removed because of the way it was poorly managed.

Photo 12: The tree's trials and tribulations continue as the next trimmer, unaware of the history of the tree, removes the sucker growth which, at this point, is pretty much the sole nutritional support of the tree.

Photo 15: Our next case is an oak tree that was treated badly about 15 years earlier. I was called to the property to remove a large top that had broken and was hanging over a neighbor's shed.
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Photo 16: This photo shows the marks left by the climbing spikes of the trimmer. Trimming with climbing spikes is the only practice that is illegal regarding tree care in Rhode Island. This practice allows many harmful pathogens easy access to a very rich vascular system.

Photo 17: Here we see an old flush cut that has been completely invaded by rot. This tree, which means quite a lot to its owner, is going to be a removal in the near future because of the previous harmful treatment administered by a professional for pay.

Photo 18: This photo shows the canker Nectria cinnabarina. The fungus invaded after an improper cut.

As professional arborists, this is our moment in time. The actions that we do today affect generations to come, and what we do is very similar to passing a torch in a relay race. For the sake of future generations, let's pass it well.

David Schwartz owns Schwartz Tree Care in Rhode Island. If you are interested in having him present a slide show on a variety of tree care topics, contact him at (401) 941-4440.
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Urban Trees Fight Back –
The root cause of sidewalk damage

By Bruce Nicoll

Tree care professionals are increasingly aware of the risks of damage to tree roots from a range of maintenance and construction activities in city streets. In addition to damage from chemicals such as de-icing road salt and herbicides, roots are killed by physical damage during cable and pipe laying and road alterations, and from soil compaction or re-grading during building construction. (See the July 2001 issue of Tree Care Industry.)

But damage isn’t one way! Roots fight back against the constraints imposed by the urban environment. In city streets, tree roots are expected to live in the narrow space between buildings and roads or under solid sidewalks. They must grow through a substrate that is often more rubble than soil. Amazingly, not only do roots normally survive in this hostile environment, but they explore its limits, continually pushing against the boundaries. As they grow and thicken within this limited space, roots distort and break manmade structures, including walls, pipes and sidewalks, causing damage to most tree-lined streets.

Most people are unaware of the damage caused by tree roots until they trip over a cracked sidewalk, yet it is a large-scale problem. One survey of street trees in Manchester, England, found that 30 percent were damaging the sidewalk. Ignoring damage of this scale is not a realistic option, especially where there is a risk of injuries to pedestrians. No one wants pedestrians to suffer injuries from merely walking along a street, and for city administrations there is the real worry of subsequent litigation. Unfortunately, some highway engineers now insist on the removal of trees that cause any visible damage and even refuse to allow planting of replacements. So to reduce the loss of our urban trees, we need to understand how the damage is caused and look for new methods of preventing it.

Damaging roots

How do tree roots cause this damage? Woody roots thicken each year, and in temperate parts of the world, the growth rings in woody roots are just as well-defined as those found in the stem. This “secondary thickening” gradually pushes
result, they often grow against the underside of the sidewalk.

Structural roots

The fastest growing roots, commonly the surface roots, thicken quickly to become the "structural" root system that holds the tree upright. Trees are supported by a system of between three and 11 large "structural" roots. These must develop as evenly as possible around the tree if it is to remain stable. A tree can be vulnerable to blowdown during storms if it has produced very few structural roots or if one or more have been removed during trenching or road construction. Evidently the number of these structural roots has implications not just for tree stability, but also for damage to sidewalks. For example, if roots are growing close below the surface, the same amount of biomass (root matter) allocated to four major roots would cause considerably more damage than if it were allocated evenly between, say, eight major roots. This is because the slower expansion of small roots can be accommodated relatively easily by compression of soil under the sidewalk.

We have learned from our studies that since the number and relative sizes of structural roots appear to be under a degree of genetic control, it may be possible to reduce sidewalk damage by using trees that allocate biomass more evenly between a larger number of structural roots.

Barriers to control street tree roots

Roots are known to be able to return to their original direction after negotiating a short barrier in the soil. This is an important part of their behavior that allows them to negotiate natural obstructions, such as rocks and stones, and maintain a direct course away from the stem. However, the longer a root is in contact with an obstruction or barrier, the more its growth direction is diverted. Edge barriers must be exposed. Once submerged, roots will simply grow over the barrier. To achieve effective root control, barriers must redirect roots and turn them downwards, roots are in contact with the barrier for long enough to be diverted completely. However, there may be a problem as roots leave the barrier. Studies at our Edinburgh research center have shown that roots tend to branch when they leave the base of rigid barriers and some of the branch roots are usually di-
shallow roots growing just beneath the sidewalk ever closer to the surface. As they expand, roots can exert a force great enough to distort asphalt or even concrete, and easily move slabbled paving. After a surface fails, the upheaval increases as roots continue to expand. Most damage is found less than 2 yards from the tree, partly because of the fast growth of this part of the root system and also as a result of the "buttressing" of roots close to the stem. As roots branch and taper, they become progressively smaller and less damaging with increasing distance from the tree. However, some damage can still be found at greater distances from the trunk.

**Sidewalk repairs**

Repairs to sidewalks normally involve grinding down or removing the offending roots, and relaying the surface. Not only is this an expensive, time-consuming operation, it is particularly harmful to the tree. Cutting roots creates sites of entry for soil-borne pathogens, further reduces the trees' already limited capability to take up nutrients and water, and risks reducing the stability of the tree. The tree is left vulnerable to disease and drought. With reduced support from the roots, there is an increased danger of overturning in high winds.

**Alternatives**

Other than merely repairing sidewalk damage when it is reported — and, in the process, damaging our street trees — can anything be done to reduce the scale of the problem? Can we develop new planting methods, select alternative, less damaging trees or species, or manage trees in ways that will reduce or avoid damage? Such measures could reduce the losses to our urban tree stock and would demonstrate to highway engineers and others that trees need not be a threat.

**Investigating root architecture**

How tree roots develop depends on a variety of factors, including soil type and structure, soil water content and temperature. It may be possible to match trees to the soil, or modify the soil conditions to produce more desirable root systems. With this in mind, we have investigated the ways in which tree root systems develop, how they respond to soil conditions and barriers placed in the soil, and the variation in rooting patterns between species.

**How do roots explore and exploit the soil?**

Trees attempt to exploit as much soil as possible by sending roots out in all directions. Soil near the surface is usually best suited for root growth. Consequently, most tree roots are found there, where they experience the highest nutrient concentrations, improved aeration, and warmer temperatures. In parts of the world with high temperatures and low rainfall, condensation of moisture on the underside of the sidewalk makes the soil near the surface particularly favorable for growth. Deeper soil horizons typically have fewer nutrients, lower oxygen levels, and cooler temperatures during the growing season, and are also usually more difficult to penetrate due to increased compaction. Although roots grow in all directions, those experiencing the best conditions elongate and thicken fastest. So, roots are found mainly in the most favorable conditions near the surface — not because they actively search these conditions out, but because branching and thickening are more prevalent.

**Surface roots**

Roots can grow just beneath the soil surface for considerable distances. This ability results from a tendency for upward growth of surface roots, compensated by a downward deflection away from increasing light and drier conditions at the surface. This combination allows roots to track below an undulating surface without emerging into the air. Where the soil is covered by a solid sidewalk, upward growing roots don't experience the signals that would tell them they are reaching the surface. As a
rected back up to the surface. When an upward branch reaches better conditions near the surface, it will take over as the dominant part of the root. Where soil below the base of a barrier is compacted or waterlogged, large roots again develop at the surface. However, if soil here is loose and well aerated, the largest roots tend to stay deep. So, appropriately designed barriers can successfully divert roots, but care must be taken to provide soil conditions conducive to root growth in the region below the base of the barrier.

Improved planting-site preparation, although costing more initially, should ultimately be cost effective.

**Root architecture investigations**

Since we wanted to know how species vary in their root development, we studied the development of the woody root system in four tree species: silver birch, wild cherry, hawthorn, and Norway maple. When trees were only 5 years old, there were already marked differences between species indicative of variation in their potential to cause damage. At this stage of development, the cherry tree had significantly more roots originating in the upper 5 cm of soil than all other species. Although the cherry trees had root biomass allocated relatively evenly between their 10 largest roots, they had a predominance of surface roots and "suckers" growing upwards from them. These traits make cherry roots particularly damaging to surface coverings.

Likewise, the birch trees had relatively even biomass allocation between roots but a strong tendency for development of surface roots, again increasing the risk of damage. Conversely, hawthorn had most of its root biomass in a few major roots, but these grew downwards, and therefore had little potential for damage.

Street tree root excavation

We examined larger trees in a tree-lined city street. These were 30-year-old cherry trees that had damaged an asphalt sidewalk in Sheffield, England. We lifted the sidewalk and excavated roots using an air tool.

When the roots were exposed, we carefully mapped and examined them. The cherry trees in this study had between two and five major roots. But the spread of roots had been largely constrained by the road on one side and a wall on the other. Most roots grew directly under the sidewalk. Downward growth was very limited: none of the root systems excavated in this study had grown deeper than 60 cm, possibly because of soil compaction. Most sidewalk cracks had been caused by roots over 10 cm in diameter. As expected, large "surface" roots had caused the most severe sidewalk damage. But more surprisingly, fast-growing roots as deep as 40 cm had also caused damage. Pavement cracks followed the underlying root direction, particularly when roots were just below the surface. It’s also possible that roots grow toward existing cracks.

**Effectiveness and risks of sidewalk repair**

In our excavated street, the sidewalk had been repaired by chiseling down damaging roots before relaying the asphalt. This appeared to have had only short-term benefits and may even have exacerbated the problem in the long term. Damaged roots had "callused" around the chiselled area, subsequently lifting the new sidewalk over a larger area. As an alternative, complete removal of large roots during sidewalk repairs avoids recurrent damage, but will impair stability. Both repair methods risk the introduction of disease into the tree. Therefore, in many cases, removing and replacing trees with less damaging ones may be the best strategy.

**The future**

Future research should concentrate on selecting trees that cause less damage, and on matching species with site conditions. Since the health and survival of street trees is put at risk whenever root systems are cut back or damaged, anything that can be done to reduce the damage caused by tree roots will also benefit our urban trees. Hopefully, improved techniques for management of street trees will one day end the conflict under our city streets.

Bruce Nicoll is a researcher with the Forestry Commission Research Agency, Northern Research Station, in Roslin, Midlothian, Scotland.
Keeping great employees is one of the toughest aspects of running a tree service. So how do you keep them? Well, it might seem contradictory, but perhaps one of the best things an employer can offer their staff is to outsource them. By using a Professional Employer Organization (PEO), also known as an employee leasing company, small firms can provide many of the benefits of big corporations with little or no increase in costs.

How does it work? A tree service (or any company for that matter) signs a contract transferring employees to the employee leasing company. The PEO then becomes the employer of record.
Staff are employed by the PEO and are leased back to the tree service. What you get is your own Human Resources department while still maintaining complete control over your workforce. The management team still runs the company, while the PEO handles payroll, state and federal taxes, workers’ compensation, and employee benefits. Small-to medium-size tree care companies can now offer 401(k) plans, health, dental, vision care, life, and disability insurance that was once only the prerogative of large corporations.

“Most people are savvy enough to understand the buying power of large numbers; with a PEO, you get it,” explains Kevin Attar, president of Surge Resources, a professional employer organization in Londonderry, N.H.

Employee leasing is a strange concept if you have never heard of it, but it is legitimate. It can help small companies with their bottom line and make them more efficient while giving employees better benefits. It’s important here to note that years ago several PEO’s that took their clients’ money and then never paid the taxes. Many small companies were left holding a large tax bill. Check first with your state’s department of labor to make sure that the PEO you sign a contract with is legally allowed to do business in your state. Some states do not have licensing laws. If your state is one of them, check the state where the PEO is located to make sure the company is licensed there.

According to Attar, there is no licensing law in Massachusetts, so whenever they talk to prospective clients in Massachusetts, they tell people to call the New Hampshire department of labor for accreditation. This needs to be done! Attar says that his firm is required to open their books four times a year to a state auditor to make sure all laws are followed. A company operating in a state without licensing laws does not have the same level of scrutiny, and it is more difficult for you to check on their legitimacy.

**PEO’s differ from personnel firms**

PEO’s are different than personnel firms. Personnel firms fill job openings; PEO’s do your paperwork and provide employee benefits.

An employee leasing company is good for employers because it:

- Reduces office overhead;
- Takes care of payroll processing and all the tax filing that goes with it;
- Gives the buying power of larger corporations, especially for workers’ compensation and health insurance;
- Extends benefits to employees that a small company might not be able to provide;
- Informs owners or managers – on a weekly basis – how much their employees cost them for payroll, taxes, workers’ comp, and unemployment insurance;
- Frees up the boss to do what he or she does best: running a tree service.

An employee leasing company is good for employees because the company:

- Provides better benefits, such as health insurance and retirement packages;
- Prints out a regular professionally presented paycheck, giving year-to-date totals;
- Organizes safety meetings;
- Gives access to human resource protocols, such as employee handbooks and an employee grievance policy.

After you sign up for the service, the process is simple. At the end of each week, you call in, fax, or e-mail your employees’ hours; the PEO already has their hourly rate. The PEO calculates the pay...
plus the percentage for social security, unemployment insurance, and workers' compensation; adds a little more for profit margin; and then replies back with an invoice amount for the week. You then pay just one invoice to cover the aforementioned expenses. No more agonizing over this year's deposit for workers' comp or fearing the end-of-the-season audit with its inevitable bad news! Instead, each week you pay a portion of the premium in your invoice.

To charge for these services, an employee leasing company marks up a certain percentage of the total weekly invoice. At times this might seem a little steep, but most of the invoice is in fixed expenses you had to pay anyway, and the insurance savings you receive should pay for the PEO's profit. Add in the time savings and extra services, and it's hard to argue why you shouldn't join.

For instance, let's assume you have a $7,000 per week payroll and perform only tree work. Workers' comp is about 30 percent, Social Security is 7.65 percent, and unemployment can be about 5 percent. This totals 42.65 percent in additional costs for each employee. In other words, that $7,000 payroll costs $9,985. An employee leasing company will mark-up the total amount by 2 to 10 percent, but because the company usually saves you more than this in your workers' comp premium, your weekly amount should be less than the $9,985.

In addition, as mentioned above, the PEO does the payroll, sends the payroll taxes to their respective government agencies, pays the workers' comp, and provides benefits. A PEO also allows a small company to have better buying power for health, dental, and vision insurance. A typical health insurance plan allows you to sign on with a regionally recognized HMO that features a low co-pay and full coverage. This means that when an employee needs to see a doctor, they make an initial $15 co-pay then the insurance company pays the rest. This is for both illness and non-work related injuries. A dental plan typically covers semi-annual cleaning and annual X-rays, 80 percent coverage for basic services like cavities, and 50 percent coverage for major work. There is usually a deductible. A vision program usually covers an annual eye exam, new lenses every year, and new frames every two years. Vision insurance programs usually have co-pays. An additional benefit of using a PEO is that medical insurance can be deducted directly from an employee's check, thereby allowing for payment in pre-tax dollars.

Perhaps the hardest part of joining an employee leasing company is trying to make your present employees feel comfortable with the switch. When my company joined one, there were a lot of questions and an initial skepticism by my crew, as well there should be. Employees may debate the ethics of the situation, or worry that you are trying to cut corners for the almighty dollar. Most just want to make sure you still have the proper insurance coverage. The other change is that they are actually no longer working for the company they originally joined.

It's an odd feeling, but once they are properly informed and realize there is an improved benefits package, they see that the only change is the name on the top of the paycheck, and everyone settles in.

One of the simplest ways the boss can ease his staff into an employee leasing company is to join it himself. That's what I did. I figured if I was going to have my employees join this company, then I would too. That seemed to reduce the initial anxiety. Once everyone saw the paychecks roll in on time, everything was fine. The other obvious benefit of signing myself up is that I, too, am covered under workers' comp.

Oddly enough, I heard about employee leasing from one of my competitors, John Farr of Farr Tree Service in Waterbury, Vt. We have a friendly competition, and when I was recently complaining to him about my dramatic increase in workers' comp, he told me about the employee leasing company they were using. It sounded strange at first, but I was staring at a doubling in insurance premiums. I gave the employee leasing company a call and within three weeks of my initial interview with my PEO, I signed on.

Although not everything has been smooth since then, the benefits of having a PEO have outweighed the negatives. They wanted their weekly payment a little quicker than I anticipated. But if you think about it, employee leasing is all a numbers business, with tight profit margins, and so PEO's need their money quickly.

Everything has its adjustments, and once you get past them, outsourcing your employees (including yourself) can be one of the smartest business moves you can make.

Michael Roche is the owner of Stowe Tree & Landscape in Stowe, Vt.
synergy (sin'ər ğe), n., Combined action whose total effect is greater than the sum of the individual actions.

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EPA Drifting in Wrong Direction

By Mark Garvin

The Environmental Protection Agency has proposed new labeling statements for a wide variety of pesticide products in an effort to control spray drift. The EPA's efforts to provide clear and uniform label language are sound, but the agency needs to refine these label statements to ensure that pesticide drift is mitigated in a way that provides the greatest benefit to the public and the environment. As currently proposed, the labeling requirement would ensure that no shade tree spraying would be possible on most homeowner properties.

The equipment and methods used in professional tree and landscape care do not justify such measures as anemometer readings, strict wind speed limits (especially the proposal requiring a minimum wind speed for application), nozzle specifications, spray height limits or "no-spray zones." Labels should focus on the need for recognizing conditions leading to increased risk of drift combined with the importance of operator responsibility to minimize drift by adjusting application methods and timings both prior to and during the application process.

Applicators using hand-held devices can readily adjust for wind speed and direction without having to conduct actual measurements or maintain arbitrary buffers. In some applications, such as in certain types of tree spraying and vector control programs, pesticide movement through volatilization may be considered beneficial by resulting in greater, or fuller, coverage of the target site and pest exposure.

Arbitrary "no-spray zones" are neither necessary nor desirable for professional applicators in our industry. The prospect of requiring "no-spray zones" between application site and "buildings where people or animals are, or may be" is in conflict with the nature of residential and commercial sites and the reason for applying pesticides to them. The entire "no-spray zone" concept should not be applicable to certain non-agricultural uses that rely on hand-held or small power equipment when operated within use patterns that include turf, residential lawns, recreational areas, and home garden and ornamental sites.

The specifications of spray height limits and wind velocity ranges in the EPA proposal would significantly affect professional tree care applicators' ability to do their jobs without affecting potential for drift. Spray height limits of 4 feet above the ground will adversely affect aboriculture and the spraying of ornamentals.

Homeowner sites (trees and lawns) tend to be small, as are the amounts and concentrations of products applied to them. Broad definitions of "sensitive" areas in the EPA's proposal could easily merge to include all or most of a typical homeowner's property. At the very least, the vagueness in the current language could contribute to unnecessary misunderstanding and even litigation by regulators, local authorities and neighbors.

"The proposed new EPA regulations regarding spray drift in urban and community forests are unworkable, as currently stated," insists Dr. David G. Nielsen, Professor Emeritus at The Ohio State University/OARDC.

Nielsen, a scientist who has worked for nearly 35 years to develop improved pest control tactics and strategies for use in urban and community forests, predicts the regulation would spell the end of tree spraying. "Anyone familiar with spraying pesticides knows that 'non-detectable levels' is a phrase that will guarantee problems for arborists who apply pesticides to prevent or mitigate damage from arthropods and microorganisms that attack trees and shrubs," he argues. "If 'non-detectable' is used in the context of the sensitive mechanisms currently available for measuring pesticide residues, then no shade tree spraying will be possible on most homeowner properties."

Nielsen adds that "When registered pesticide products are used according to label directions, following proper application protocols, little measurable, non-target effects can be expected." He asks that if the EPA or others have data to refute his contention, then "I and others would like to see it."

"The EPA regulation as written would put every tree care company out of the pesticide application business," agrees Paul Wolfe, owner of Integrated Plant Care in Rockville, Md. "There is off-target residue on any application."

Many pesticide labels read "spray until wet" or "spray until dripping" Wolfe points out. "In the small areas in which we work - typically a quarter acre property - there may be residue that goes onto the other side of the fence. Certainly applicator training is a key in all of our operations. The skill
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of the applicator minimizes our potential problems. However, the way this regulation reads, pesticide application for tall tree spraying would be impossible—regardless of the skill of the operator.”

The alternatives, in Wolfe’s opinion, are not attractive for the future health of the urban forest. “There are soil injections and materials that can be injected into the tree,” he admits, “but costs tend to be higher and many pests cannot be managed through systemics. This regulation would severely limit our options. And there are instances where those sorts of treatments are impractical. For instance, a street tree job of 500 trees that need treatment.”

Right-of-way (ROW) applications

Professional ROW application managers currently do an excellent job of managing drift and off-target deposition through use of site-specific product selection, application equipment and technology unique to their applications and timing of the tools used. For Integrated Vegetation Management (IVM) to be effective in the best interest of the public and the environment, professionals must have all tools—mechanical and chemical—to employ on site-specific basis. Language in the current EPA proposal is based on agricultural spraying assumptions that are not valid for most ROW applications.

Implementation of the proposed standards would effectively eliminate the ability of ROW managers to use herbicides as vegetation management tools. This would increase costs to consumers. Since mechanical control measures would be less effective without the concurrent use of herbicides, the result might be less reliable energy transmission and increased highway and railroad travel risk.

The use of “no-spray zones” and “sensitive areas” are of concern due to the fact that no clear definitions are provided by the EPA, creating the opportunity for broad definitions. Since many ROW are relatively narrow, the assignment of “sensitive areas” and “no spray zones” could strictly limit where herbicides could be applied.

Professional IVM applicators currently utilize a number of processes to insure drift and damage from drift is minimized:

1. Right-of-ways are evaluated to determine the appropriate application technique prior to making site-specific plans. An integral part of this evaluation is the type of land use and unique ecological features adjoining the right-of-way and the degree of sensitivity to potential drift. ROW are typically mapped with sensitive crops, residences and areas of ecological concern noted so appropriate protective measures can be taken.

2. Applicators are trained to use application techniques that will minimize drift and potential for drift. This training includes recognition of sensitive areas and conditions that increase drift potential.

3. Drift control products are available, and are typically carried on each spray unit for use when conditions increase the potential for drift.

4. Application technology has evolved so that most utilities, transportation departments, railroads and other ROW managers use relatively low pressure and lower volume techniques for ground applications.

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These technologies contribute greatly to minimizing drift and the damage that would result. These technologies continue to evolve as the industry implements additional low volume techniques (such as use of invert emulsions), improves nozzles and droplet control technology, and develops systems where the application is completely shielded from wind. This equipment, while often based on agricultural technology, is substantially different than equipment now used in agricultural applications.

5. Aerial application needs in ROW spraying are very different from agriculture. Since ROWs are long, narrow and often bordered by tall trees, across-the-board requirements for application height above the “canopy” are not operational or safe. In addition, the helicopter must fly a safe distance above wires.

6. There are mandated programs for control of invasive weed and tree species, as well as aquatic species, that would not be feasible without the availability of herbicides. The current EPA proposal does not address these and could result in inability to control invasive species and protect critical habitat for wildlife. Many utilities and line-clearance companies have entered into agreements with conservation groups and to manage their ROW to provide continuing habitat protection.

Professional applicators have strong motivation to minimize drift and the potential for drift. Utility, roadside, railroad and other contracts for herbicide application typically require the contractor to assume all liability for results of the application. This includes liability for off-site damage resulting from drift or misdirected application.

A reliable supply of energy and good public highways and transportation corridors are important parts of our infrastructure. Right-of-way managers need all the tools available to effectively manage rights-of-way for safe reliable energy distribution and transportation.

The ability to maintain ROW is important to the public health, safety and welfare and is best done using an Integrated Vegetation Management approach. Professional arborists should not be hindered in their choices of all the tools available, including herbicides, to select the methods that are best suited to the particular site and need while protecting the environment.

“It would be devastating,” to ROW agrees Rick Johnstone, system forester for Conectiv Power in Wilmington, Del. “This all started from a meeting between chemical manufacturers and the EPA to develop regulations that would be workable for agriculture. That’s fine for that industry, but we were caught up in the process. The EPA isn’t taking into account what we do, how we do it and what we can do to prevent drift.

“For example, the language mandating a 300-foot buffer zone from people and animals might make sense if you are in a corn field in Iowa. But if you are trying to treat a ROW in New Jersey, forget it,” emphasizes Johnstone. “We’ve gone in [to wetlands] with a backpack and treated trees we don’t want and controlled invasive species that would weed out the endangered plants if left unchecked. If EPA enacts this regulation, it will be condemning environmentally sensitive areas to become deserts. Nothing will be left but invasive species.”

Johnstone met with EPA officials and showed them some of the differences between agriculture and ROW management, as well as some of the techniques in use to minimize drift. “The EPA was very open. They asked if these were the types of things that could be put on a label.”

The goal, according to Johnstone, was not to ban spraying but to promote best management practices. He doesn’t believe the EPA plans to adopt the regulation as written for arboriculture.

“Do we have a drift problem?” he asks. “We aren’t treating thousands of acres of corn from fixed-wing aircraft. “We told them that if they wanted to adopt this regulation for large-scale agriculture, go ahead. We will sit down to develop best management practices for ROW spraying. If there is a concern, we’ll work with them to resolve it. But don’t lump us all together.”

Conclusion

Applicators, suppliers and distributors have invested resources to minimize and prevent drift from causing adverse effect to non-target plants, other organisms and natural resources. While drift will always remain a risk, it is a manageable risk, and one that the application industry has managed well. Financial liability and the need to have positive public perception of the industry require applicators, suppliers and others involved in the industry to protect human health and the environment, including concerns associated with drift. More restrictive label language based on agricultural application needs and concerns will only serve to limit the use of effective management tools and would result in unexpected negative public and environmental impact.

Mark Garvin is vice president of public policy and communication with the National Arborist Association.
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Let's say you want to start making changes in your company because things aren't going exactly the way you would like. Or maybe things are going great, but you still want to see them running better. You know it's time for a change, but you are not sure what to do next. Taking the proper approach to marketing can draw more customers to you and help keep the ones you have. Here, we will take a look at the questions surrounding marketing:

- why you want to market;
- what you need to market;
- to whom you will market;
- how to market.

Why you need marketing

First, ask yourself, "What has brought our company to decide that we need to change our current position?" The answer can fall into one of several categories of contributing factors:

1. You are losing money
   Basically, this translates into not making the profit/return that your organization should be making for the investment put into it. In many organizations, owners constantly look at this. Customer pressures and expectations are always changing, yet recent shifts in the economy have brought many organizations to realize that they might not be able to operate as loosely as they have in the past.

2. The competition is winning
   If the competition is beating you to customers, you're going to try to capture the market from them. You are going to have to do something different. The competition is reading the same books you are and is looking at this situation at the same time you are. Remember that the competition is constantly changing, too.

3. Ownership direction is not focused
   Someone decides that he wants to move out of active ownership. Another person decides she wants to refocus the entire organization. Someone else decides that the company has spent enough on equipment and/or materials and thinks the company should just "ride it out" (which seldom works).
   Be sure to take a close look at your company. Are you where you want to be, or are you in need of a change? Are you making yourself go insane? The definition of insanity is believing that you can achieve different results in the future even though you continue to do things the way you do them presently. Prevent insanity! If you want a larger part of the market and to be more active in terms of profitability, then you are going to have to take some specific steps. This is where marketing comes in.

What do you want to market?

What products and services do you want to sell? Are you a niche company, selling specialized tree care services to a targeted market? Do you deal with certain crisis situations, such as weather-related conditions? Or are you a full-service generalist in the industry, providing a wide variety of tree and landscape services?
   You may be thinking you are all three of those things – which
you may be. If you want to convey this information to your customers, however, you must develop a strategy to address each of those three positions. You must be certain that the prospective customer out there knows this information about your company and is willing to beat the pathway to your door rather than any competition.

To whom do you market your services?

Remember the purpose of marketing:
To have somebody buy your services instead of someone else’s. There are three main reasons why people make decisions about buying from you or from your competition: Responsiveness, quality of work, and pricing.

Responsiveness is the time it takes you to address a customer’s needs, either by showing up on the propery or returning a phone call. For two of the past three years, I have tried unsuccessfully to convince an arborist to come out and trim my trees. You can’t believe how many messages I have left, and you can’t believe how many lies I have been told by different companies. Promises made, appointments scheduled, and nobody shows up. I am not sure why these companies put their names in the paper or phone books. They are not going to follow through. They are non-responsive and overwhelmed through the season.

The next thing to consider is the quality of your work from the time your crew arrives until the time they go home. Keep track of the measurable intangibles for one day. Was there any collateral damage associated with your work that day? Were they paid for and cleaned up the way they should have been? A friend of mine recently had an arborist take down a tree that was close to a patio. There was a fountain on the patio that was a family heirloom. A falling limb cracked it in half. The worker told my friend he could pick up a fountain for $12 at K-mart. My friend was not pleased. The customer sees the big picture, from the time of your first contact all the way through payment and warranty.

In terms of direct and indirect pricing,
the customer thinks, “What is it going to cost to do business with you?” In the age of the Internet, people are used to being able to get a lot for free. When they deal with you, they want to find out what they can do to maximize the value from their transaction. You have to make a decision as to what you are willing to give away and what you are not willing to give away.

There are three things that need to be done in determining a price. First, price situations and make certain you cover your costs properly for the correct return. Second, know that you are speculative at that point and should build some sort of cushion until you know that the relationship is correct. Third and last, if you are developing long-term contracts, you need to have the right to be able to look back at past snapshots to make certain that your pricing held true. If you don’t do that, you harm yourself.

The basic steps of marketing

There are some basic steps to follow to a successful marketing campaign. Do some market research. Determine what your markets are. Then, look around and create a market strategy that responds to that research. Next, devise an implementation plan. And don’t forget that you will most certainly want to be able to measure your results to know that you are getting what you are paying for.

For the largest companies, market research is a sophisticated and expensive operation. For a small tree care company, market research is looking around and asking around — acting almost as a “barometer” in your area — to see trends. What do people you serve typically need or want? Know the special considerations in terms of delivery, yard conditions, golf course conditions or community conditions — and be aware of special little things.

Market strategy is like creating a map for marketing. What is the first thing you have to do when you use a map? Determine where you are, and then figure out where you want to be. That is what a marketing strategy does. It’s a plan for your business’ future. Someone has to decide on the dream for the organization. This would include how big, how good and how price-conscious you will be. What are the specific objectives? You will also need to know what you are going to allocate in terms of resources.

After you have your strategy, create an implementation plan. This puts into words and actions what you will be doing to follow the plan you just mapped out.

Finally, measure the results of your marketing to make certain that you are getting what you intended. When you get a new customer calling, ask him how he
found your business. Did he see your ad in the Yellow Pages? Was it the flyer you sent out last month? It is important to track your results so you can see what is worth spending valuable marketing dollars on – and what is not.

**Other marketing concepts to consider**

**Timing is everything**
Consistently look at timing from the customer's prospective. Keep in mind that discretionary income is important to people. If a homeowner wants a boat but has a problem with the septic system, money will be allocated to the most pressing need. A tree across the driveway is a pressing need, but dead limbs in a maple in the backyard might not be. Nevertheless, plan your marketing approach during the winter to fill the upcoming spring season.

**When do you expect a response?**
When do you expect people to respond to your marketing efforts? When will you advertise? People might take a while to respond. It may take a bit of time before customers are ready to call. You have to set up a schedule that will be different for every type of client. Consider your recurring and repeat business. Use that newsletter to keep in touch with people. Notify them of seasonal updates and what they need to be thinking about. If you had a Web site, keep it up-to-date so customers know they can always get new information there and will keep going back.

**Follow-up service**
What kind of follow-up service does your company have? It is very important to stay in touch with customers, however you choose to do it. Any computer program that will allow you to remember customers, catalog the services that they want, contact them during specific times favorable to you, and sweeten the advantage to them is worth it.

Staying in touch sometimes means sending out a quarterly newsletter or e-mail. Staying in touch sometimes means a phone call, either aggressive campaigning or a simple follow-up call. Make sure you get real value back from your customers. Stay in touch with them, and you will see your marketing dollars pay off.

**The “WIIFM” Principle**
The world operates off a simple principle called, “WIIFM”; it stands for, “What’s in it for me?” The customer always asks himself this question as he listens to your sales pitch or reads about your company in the local newspaper. "If you are going to reduce my price and assure me that you can do the work with-
out damage – and if you can do a better job for me on certain types of services – then I will choose you.”

Therefore, you want to highlight the services you provide each month or season. You would not want to highlight the fact that you guarantee your tree planting services in the middle of January or February, but highlight the services that people are likely to buy in winter. Focus your effort. You can use your newsletter to recurring customers on the prospect list that you have developed to address these issues.

Take a look in the proverbial mirror
What is your image in the community?

Are you a “mom-and-pop” organization? Do you have the correct safety and insurance coverage? Do you offer specific services to clients? Are you a clean operating organization? Do you have employees that represent your image well?

What are your strengths that make you stand out from the competition, or at least put you on an even playing field. What is unique about you? Is it your technology or technical knowledge? Is it your responsiveness or pricing that are going to draw people? What are your weaknesses? Technology costs money; trained people cost more than non-trained people. What is your balance sheet in terms of strengths, your assets and weaknesses, and your liabilities?

Knowing what you know about your image, your customers, yourself and your competition, you can ask yourself where your opportunities are.

Conclusion

You need to be aware that every time a customer’s needs change, your relation to your market changes. Every time that you have changes in your company capabilities because of technology or employee loss, you have changes in your paradigm. Every time labor availability changes, you have potential issues. Any time that you as the owner of the company decide to change your emphasis, the company in turn has changes. Make those changes based on a thorough understanding of your company and your markets.

Don Willig has been a consultant to a variety of organizations for over 17 years. During this time, he has provided clients with more than 300 specialized programs designed to produce personal and corporate efficiency and effectiveness. He specializes in organizational performance, leadership, team diversity, and continuous improvement training. This article was excerpted and adapted from a presentation at TCI EXPO 2001 in Columbus, Ohio. A tape of the lecture is available for $10 by calling 1-866-827-3778 or at www.soundrecordings.org.

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Surviving on the Pacific Coast: The Torrey Pine

By Branley Allan Branson and Mary Lou Branson

Battered by strong winds blowing off the Pacific Ocean, Torrey pines often take on asymmetrical shapes, their limbs swept upslope. Many of the trees clamor up the nearly barren cliffs like trimmed hedges, barely clinging to their precarious habitat.

Botanists and dendrologists alike often refer to California as a "floristic province," principally because of the high degree of plant species endemism (species of plants that occur in only one area). It has been estimated that about 1,500 of the 5,000 species known from California occur there and nowhere else. Most of these endemic species occur in southern California and along its central coast. Some plant genera in California include a remarkable number of endemic species. Included in this list is the genus *Pinus*, or pine tree.

The central coast of California possesses several coniferous trees that are entirely restricted to small areas, including the famous Monterey cypress (and some lesser-known cypress species) and the Torrey pine, Monterey pine, and Bishop pine. These trees are species that at one time enjoyed a much wider distribution but have become restricted to much smaller ranges as environmental conditions have changed over millions of years. We know this from the study of well-preserved fossil deposits.

The Torrey pine (*Pinus torreyana*), sometimes called Del Mar or Soledad pine, has a severely restricted distributional range. A 1,750-acre preserve, located near Del Mar about 20 miles south of Encinas in San Diego County, Calif., protects about half of the known Torrey pine. The remaining plants are located on Santa Rosa Island, approximately 200 miles north of Del Mar. Some specimens have been artificially transplanted elsewhere, sent to other California towns (including Carpenteria) and New Zealand. The Torrey Pines State Preserve, located between La Jolla and Del Mar, Calif., was established in 1921. It includes an old restaurant that was remodeled to serve as a visitor's center.

The Torrey pine was first observed by scientist Charles C. Parry, a physician-botanist who served with the U.S. Mexican Boundary Survey during the mid-1800s. Another man working on the survey had traveled through the Del Mar region some years earlier, and related his encounters with the peculiar-looking pine to Parry. Parry took leave and hurried to Del Mar. He immediately recognized that the tree was unique among those of the pine world. He formally described it as a new species, naming it *Pinus torreyana* in honor of his botany teacher at Columbia University, Dr. John Torrey. Parry considered the Torrey pine to be most closely related to the digger pine (also known as the gray pine), *Pinus sabiniana*, or, perhaps, the Coulter pine (*Pinus coulteri*).

The slow-growing Torrey pine can reach about 60 feet—usually much less than that—in its natural environment. However, the so-called ward Torrey pine, planted in Carpenteria in 1894, grew to more than 100 feet, with a girth of 5 feet, by 1947, and was still healthy, with a symmetrical crown.

Old Torrey pines have deeply fissured, reddish-brown, thick bark that is broken up into broad, flat scales that are often spongy to pressure. The twigs are bright greenish for the first two years after appearing, but they turn nearly black by the third year. The grayish-green, 8- to 13-inch long needles are arranged in bundles of five at the tips of the twigs, mostly in clusters at the ends of the branches. Each needle is provided with numerous stomata that are distributed on all the faces. The trees generally have unusual shapes, with limbs that are twisted and askew, and asymmetrical crowns. The branches nearest the earth often sprawl for considerable distances from the trunk.

In exposed depressions on the cliffs facing the Pacific, the trees are often sheared into low, nearly prostrate and hedgelike configurations. All these features are, of course, in response to the strong, prevailing winds that blow in from the ocean, causing the trees to be better developed on the leeward side of the trunks than on the windward side.

Visitors often notice large, dark-green clumps of plant material growing among the sparsely needled crowns of some of the trees. These growths are not parts of the trees. They are, instead, mistletoe-like parasites that attack the trees. The parasites do not appear to inflict much damage to their host.

During the reproductive season, the trees produce an abundant number of male and female flowers. The male flowers take the form of dense, yellow clusters at the ends of long stalks, from which they disseminate an amazing amount of yellow pollen. The female flowers, also on long, sturdy twigs, are purplish. They develop into asymmetrical, dense, long, 4- to 6-inch wide cones. At first, the cones are dark green, but they...
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The inch-long seeds produced in the cones are more or less bi-colored, being yellowish-brown on the upper side, mottled on the lower. The seeds are partially surrounded by wing-like tissues that aid in dispersal. Although the reproductive potential is high in the Torrey pine, very few of the seeds actually germinate, and survival of seedlings is relatively low. Because the environment of the trees is a formidable one (with soil of low fertility), competition for survival is strong. The sweet-meated seeds were eagerly collected by the local Indians in the past, and these days, the seeds are devoured by birds, squirrels and other rodents.

In addition, in their native environment, Torrey pines are slow growing, few living more than 100 years. Taken collectively, all these features spell a low population status for this rarest of the pine species. Luckily, the unusual growth patterns, in conjunction with the coarse-grained, brittle characteristics of the wood, have made the tree of little commercial value. The heartwood is pale yellow and the sapwood is rather thick, pale yellow to nearly white.

The Torrey Pines State Reserve is a very interesting place that should be on the itinerary of anybody touring the coast of California. The wind-swept mesa that supports the trees has been eroded over thousands of years into a series of barrancus, arroyos, and small canyons that dive toward the color-banded sandstone cliffs that plunge straight down for more than 100 feet to a long, curving beach and series of huge, golden dunes, all backdropped by the blue Pacific Ocean. The wind, shipping up from the ocean, literally sings through the branches of the Torrey pines, giving the whole scene a preternatural appeal.

In the hollows and concavities of the mesa grow the misshapen Torrey pines. There are probably no more than 2,500 of them in existence, making this the rarest pine in North America, probably in the entire world.

Time and ineluctable environmental changes have left this splendid little tree a captive of the modern world, its fate yet to be determined.

Branley Allan Branson and Mary Lou Branson are research biologists in Richmond, Ky.
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Trimming for Tourism

Tourism officials in the city of Fort Lauderdale, Fla., sparked some controversy when they pruned or removed several trees along a main road in order to make way for a parade. A parade of airplanes, that is.

According to the Ft. Lauderdale Sun-Sentinel, the tree work was done in anticipation of the Aircraft Owners and Pilots Association convention. That convention was to begin with as many as 75 small airplanes taxiing through downtown along U.S. Route 1 from the airport to the city’s convention center.

One resident called the decision to remove "perfectly good trees" a "disgrace." But overall public opinion seemed to be muted. About 65 trees were affected, though most were to be only pruned or moved. Nine trees were cut down to clear the parade route.

City officials made no attempt to hide their motivations. The convention was expected to bring up to 10,000 people to the city and as much as $10 million worth of spending to the area economy. By comparison, the tree work, including replacements for the black olives, Gumbo Limbos and bottle brush trees that were to be removed, cost the city about $30,000.

Careful When You Dig

In a case that has potential ramifications for anyone who works on or near trees, a woman in suburban Chicago sued a local gas company claiming that its work killed a large pine near her house. Marianne Nemtusiak, the owner of a landscaping company, is suing for $100,000 after a 57-foot Scots pine died within two years of work done underground by the Nicor Gas Co.

According to the Chicago Sun-Times, the woman claims in her suit that the gas company and its contractor negligently and carelessly damaged and killed the tree by cutting its roots.

The landscaper's suit claims the tree was a landmark on the road and for her own green industry business. She seeks damage for "the loss of the use and enjoyment of the tree and its value."

"I feel that the tree has a unique value merely for the fact that it has survived," Nemtusiak told the newspaper. "It's older than we are, and it has survived until this point when it was interfered with. It has seen a lot of history."

Ashes to Ashes, Sawdust to Sawdust

When a 300-year-old oak tree in Walnut Creek, Calif., could no longer be kept alive safely, the owners of a nearby arts center wanted to give the tree a proper sendoff.

But finding a religious figure to do a funeral for a tree proved no easy task, according to a story in the Contra-Costa Times. After striking out at local churches, the director of the aptly named Shadelands Arts Center found a seminary student who had just finished graduate thesis research work on the subject of trees as religious symbols.

The student, Therese Baumberger, was joined by a local member of the Apache tribe in leading the ceremony. As soon as it ended, crews began to remove the decaying 60-foot tree.

The city is storing large sections of the tree over the winter and plans to ask local artists to carve something from the pieces for a future gallery display.

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Old School, New School
By Todd Kramer

Techniques and equipment sure have changed a lot for the climbing professional in the past 10 years.

I started working full-time in the tree care industry in 1989. My foreman, Ralph McMahon, a 15-year veteran at the time, was one of the most talented tree climbers I had ever seen.

His methods were “old school.” His gear consisted of a basic seat harness, a non-locking steel snap, a 3-strand rope and a large steel ladder hook. He did have a floating Prusik lanyard that he referred to as a “sissy strap.” The floating Prusik stayed in the truck except for large tree removals. Ralph believed that using a lanyard when you really did not need it would become a crutch and hinder your true potential. He shared the same thoughts about climbing and pole saws.

I climbed this way for five or six years, becoming a top climber at our company and competing at ISA chapter competitions. My brother and I dominated the area — in the past with only a few ropes as our equipment. Just like with the climbing equipment. I dismissed their techniques because our performances seemed the same. Since we did not understand the advantages, we would poke fun instead of trying to learn from them.

I first considered new techniques when I became the crew leader of our removal crew. We owned a crane and I was the climber. There was a lot of retying-in. I started using split tails and spliced eyes, carabiners instead of steel snaps. During this trial period, I hated it! I was learning all over again. Those darn three-handed carabiners were very frustrating, especially in the winter. I was just about to give up on it all when I saw a guy by the name of Norm Hall using similar equipment. He did not appear to have all my frustrations. His climbing was smooth, controlled and confident. I thought, “I want to be like that!”

Norm encouraged me to keep trying. I found a carabiner I was comfortable with and my frustrations eased. After several years, I was using the very latest techniques. I discovered those guys with a harness full of equipment really did know something. Now, I was climbing in a much safer way. Productivity went up and fatigue went down. I could climb longer without getting as tired. These days, I would not think about leaving the ground without my “fancy stuff.”

Our company is known for removing some of the most challenging trees in our area — in the past with only a few ropes as our equipment. Just like my experience with new climbing techniques, I had the “old school” attitude toward new rigging. Once again, Norm convinced me to try. Just like with the climbing equipment, I experienced frustrations in learning something new. I knew these techniques were slowing me down. As I practiced using slings, pulleys, blocks, friction devices as well as mechanical advantage systems, my rigging became safer, faster and a lot less work. Once again, I found these systems work. But it took time, practice and a lot of homework. Once I became comfortable with the equipment and the techniques, it became very rewarding for me and the crew on the ground, since the new systems allow the ground crew to handle the ropes more easily.

I am now a full-time trainer. Of the climbers we have hired, some have had years of experience but no “new school” training. They often have the same attitude toward new techniques and equipment that I held previously. However, once we start climbing side by side, they always come around. They experience the same problems and frustrations, but with practice eventually they realize the advantages.

The most challenging part of training “old schoolers” is having them slowly understand that the new techniques and equipment come with new responsibilities. Often they think they can treat an aluminum carabiner the same as a steel snap. All of the new techniques have advantages and limitations. You need to be aware of those notations to use the “new school” methods to your advantage.

For all of you “old schoolers” out there like me, I encourage you to sign up for a training class and give “new school” methods a try. It will be very frustrating at first, but it will pay off in the end.

Todd Kramer is director of field operations & education with Kramer Tree Specialists, Inc. in West Chicago, Ill.  

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