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OUTLOOK

Please, Spare Me the Pleasure

From southern California to Maine and from Florida to Oregon, Mother Nature can wreak havoc with our trees. Whether it is wind, rain, fire, ice, snow, earthquake or any combination of natural disasters, severe weather and other calamities of nature usually result in substantial tree damage. Phones never stop ringing, regular customers become unhappy and a huge strain is put on the cash flow. Many times, such work is not even profitable.

Yet, I hear it all the time. In February it might be, “We could use a good ice storm about now.” In September it’s, “Hope that hurricane lands nearby.” In December it might be, “Need a pretty good wind storm to generate some work.” Of course, I don’t hear those comments from everyone. The established companies usually have a sufficient backlog and really don’t need storm-generated work.

In fact, if anything, the owners of established companies hope that the next storm misses them. If you haven’t experienced a storm situation, you might not appreciate this: Storm work has diminishing returns. Many rush around responding to frantic calls from panic-stricken consumers. Crews work long hours. Often, a crew arrives at a job only to find that someone else has done the work for less money than you quoted. In some cases, only emergency work is possible, leaving the remainder to be completed later. Such operations are, obviously, very inefficient.

Further, equipment tends to suffer abuse and maintenance costs get out of hand. Customers are difficult to satisfy, because everyone wants the work done yesterday. Often, payment for the work is contingent upon an insurance company settlement, which doesn’t always happen overnight. Cash flow becomes more critical as there is always lots of overtime and other increased direct expenses that have to be financed immediately.

As one tree company owner in California told me last winter, “Please, spare me the pleasure of another natural disaster. I don’t think I can afford the prosperity of the additional work.”

Robert Felix, Publisher

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Troubles in the Rhizosphere
By Dr. Alex Shigo

The rhizosphere is a battleground and the wars are continuous. The more you know about the rhizosphere, the better the chances are that your treatments will lead to benefits rather than harm.

How to Find Good Employees
By Peter Sortwell
Innovative strategies for finding and hiring employees.

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Troubles in the Rhizosphere

By Dr. Alex Shigo

The root of this horse chestnut grows first from the energy in the seed. Roots cannot make their own energy. The root “pumps” start first and the top “pumps” follow.

Rhizosphere Wars

The rhizosphere is the absorbing root-soil interface. It is the zone, about one millimeter in width, surrounding the epidermis of living root hairs and the boundary cells of mycorrhizae as well as hyphae growing out from some mycorrhizae.

The rhizoplane is the boundary where soil elements in water are absorbed into the tree. Under an electron microscope, the rhizoplane appears as a jelly where microorganisms and tree cells mix, making it impossible to tell which side is tree and which is soil.

A constantly changing mix of organisms inhabit the rhizosphere and surrounding soil. Bacteria, actinomycetes, fungi, protozoa, slime molds, algae, nematodes, enchytraeid worms, earthworms, millipedes, centipedes, insects, mites, snails, small animals and soil viruses compete constantly for water, food, and space.

The rhizosphere is a battleground and the wars are continuous. Amoebae are eating bacteria. Some bacteria are poisoning other bacteria. Fungi are killing other fungi. Nematodes are spearing roots. Fungi are trapping nematodes. Earthworms are eating anything they can find. Sometimes the victors benefit the tree and sometimes they do not.

Every tree treatment affects the rhizosphere in some way. The more you know about the rhizosphere, the better the chances are that your treatments will lead to benefits rather than harm.

Declines and the Starving Rhizosphere

Go anywhere in the world and you will learn that some local trees have a “new” decline problem. Declines usually mean the trees are sick because there is a problem in the rhizosphere.

Trees die, as all organisms do, in three basic ways: depletion, dysfunction and disruption. Disruption means wounding, severe mechanical impacts and fracturing. Dysfunction means some parts and processes of the living system have developed problems that retard or prevent their functioning and growth. Depletion means that the basic substances for life...
begin to decrease to the point where injury and death are certain. One of the ways depletion injures organisms is by starvation.

Soils and wood share a common problem: They are thought of as dead substances. This has come about because wood-products research gained an early lead over research on wood in living trees. With soils, many texts still define soils as “loose material of weathered rock and other minerals, and also partly decayed organic matter that covers large parts of the land surface on Earth.”

Sapwood in living trees has many more living cells than dead cells. In upper layers where most absorbing roots of plants grow, soils have more soil organisms than grains of weathered rock. In great disrespect, most people still refer to soil as dirt! When researchers first discovered the great value of soil microorganisms for human antibiotics and profit, the living nature of the soil began to emerge.

A more correct definition of soil should be that it is a substance made up of sands, silts, clays, decaying organic matter, air, water and an enormous number of living organisms. Survival of all living systems depends greatly on synergy and efficiency to optimize the functioning of all processes and to keep waste as low as possible. When synergy and efficiency begin to wane, declines follow.

Trees are dependent on the light energy from the sun for their energy, water and 14 elements from the soil for their building blocks of life. Some trees decline when incorrect treatments or abiotic injuries lead to starvation of organisms in the rhizosphere. When there are troubles in the rhizosphere, there will be troubles with the tree.

**Energy & Root Exudates**

Microorganisms compete in the rhizosphere, an area rich in exudates from the tree. The exudates contain carbohydrates, organic acids, vitamins and many other substances essential for life. From 5 percent to 40 percent of the total dry matter production of organic carbon from photosynthesis may be released as exudates! When trees begin to decline, the amount of organic carbon released as exudates increases. Mineral deficiencies, low amounts of soil air and severe wounding are major causes for the increase. Another way to say this is that an increase in exudates would be caused by over-pruning, construction injury, planting too deeply, over-watering, compaction and planting trees in soils that have a pH too high or too low for their optimal growth.

You would think that a tree in decline would decrease not increase exudates. A possible explanation might come from the self-thinning rule of ecology, which states that when energy input into a site equals output, there will be no further growth unless some trees die. As many suppressed trees die, a much fewer number continue to grow bigger. Simple. Or, on the basis of the mass-energy ratio law, as some trees on a site get bigger, many smaller suppressed trees will die. As the suppressed trees decline, they contribute a higher percentage of their soluble carbohydrates to the rhizosphere. The increase in exudates from a declining tree with a defense sys-
Mycorrhizae covered by hyphae. Water and elements often are absorbed into the hyphae and then the tree. The hyphae extending from the mycorrhizae greatly increase the area for absorption.

A tree does not "know" why it is dying. In a crowded, young, growing forest, the self-thinning rule of ecology does benefit tree survivors and all soil organisms. But, when one or two trees in a yard, city or park start to decline, their early death may benefit only the root pathogens. And even worse, since the tree will be cut and removed from the site, there would be no benefits from added carbon to the soil.

A Closer Look at Roots

Woody tree roots are organs that support the tree mechanically, store energy reserves, transport water and the substances dissolved in it and synthesize substances such as growth regulators, amino acids and vitamins that are essential for growth.

Trees have different types of root systems. For example, mangroves along coastlines have stilt roots. Many trees growing in tropical areas have aerial roots that become prop roots when they grow into the soil. Other trees have strangling roots that eventually kill the host tree that first supported their growth. Trees in sandy soils can have roots that grow downward over 90 feet. Palms have roots that are adventitious and grow from meristematic regions in their base. Many tree species have deep roots when they are young and more shallow roots later.
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would be nearly impossible for the strongest person to pull out young saplings of beech, oak or hickory from forest soil.

Woody roots have cells with walls of cellulose, hemicellulose and lignin. Lignin is that natural "cementing" substance that gives wood its unique characteristic for strength. Woody roots also have an outer bark or periderm made up of three layers: the phellogen, phelloderm and phellem. The phellogen is the bark cambium. The phelloderm is a thin layer of cells on the inner side of the phellogen. The phellem is the outer corky layer. Phellem cells are impregnated with a substance called suberin, which is a fatty substance that prevents water absorption.

Some characteristics of woody roots are:
- They do not absorb water.
- They have no pith.
- Their conducting elements are usually wider than those in the trunk.

Non-Woody Roots

Non-woody tree roots are organs that absorb water and elements dissolved in it. The two basic types of non-woody roots are:

1. Root hairs on non-woody roots are extensions of single epidermal cells. Common on seedlings, root hairs grow to maturity in a few days. They function for a few weeks and then begin to die.

2. Mycorrhizae are the other type of non-woody roots. Mycorrhizae are organs made up of tree and fungus tissues that facilitate the absorption of phosphorus-containing ions and others essential for growth.

The fungi that infected developing non-woody roots to form mycorrhizae were very "biologically smart." Rather than competing with other microorganisms in the rhizosphere for exudates from the tree, the mycorrhizal-forming fungi went right to the source inside the tree. And, even more to their advantage, many of the mycorrhizal fungi grew thread-like strands of hyphae—long, vegetative tubes of fungi—out from the mycorrhizae. This inside and outside presence gave the fungi a distinct advantage over other microorganisms in the rhizosphere.

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A block of frozen soil several inches deep was lifted away to reveal these mycorrhizae and strands of litter-decomposing fungi. Note the cavities surrounding the mycorrhizae.

1. With their extended hyphae, mycorrhizae not only greatly extend the absorbing potential into the soil, but the hyphae may connect with other hyphae on other trees. In this way, the mycorrhizae serve to connect trees of the same or a different species. This leads to the conjecture that the natural connections that developed over long periods in the natural forest may have some survival value. That is why forest types are often named for the groups of species commonly found growing together. For example, we speak of the birch-beech-maple forest, or the pine-oak forest. From a practical standpoint, when trees are planted in cities and parks, there may be great survival advantages by planting groups of trees made up of the species that are normally found together in natural stands.

2. The mycorrhizae have been shown to provide some resistance against root pathogens. It may be that the pathogens would have difficulties in building their populations in the rhizosphere dominated by the mycorrhizal fungi.

3. Perhaps the most important feature of the mycorrhizal fungi is that their boundary material is mostly chitin. Chitin is slightly different from cellulose by the replacement of some cellulose atoms by a chain of atoms that contain a nitrogen atom. This slight change in some way makes chitin a material better suited for absorption of elements. Remember that the fungus hyphae gain all their essentials for life by absorption through their boundary substance.

There are other advantages to the chitin and the tube-like hyphae that ramify the soil in the rhizosphere and beyond. When the hyphae die, they add a nitrogen source for other organisms. Also, when the hyphae are digested, they leave tunnels in the soil that are about eight to 10 microns in diameter. For the bacteria, these small tunnels may mean the difference between life and death. The bacteria quickly colonize the tunnels. The survival advantage here is that the major threats to their survival are protozoa that are usually much larger than 10 microns. So the hungry amoebae are not able to get at the bacteria inside the eight-micron tunnels.

A common treatment for compaction is to fracture the soil and add water. The fracturing allows air to penetrate the soil, but does not provide any eight-micron tunnels for the bacteria. The only way to bring back the tunnels is to bring back the fungi in well-composted wood and leaf mulch, as nature does, or by inoculating the mulch with mycorrhizal fungi.

Who Was First?

I do not know if the fungi were the first to grow into the root to get first chance at exudates or whether it was the bacteria. Regardless, bacteria and their close relatives, the actinomycetes, also infect non-woody roots to form organs that serve for the fixation of atmospheric nitrogen. Fixation means that the nitrogen that makes up almost 80 percent of our air is converted to a soluble ionic form by the action of the bacteria and actinomycetes within the nodules on the roots. (Some free-living soil bacteria can also fix nitrogen.) An enzyme called nitrogenase is the catalyst for the reaction that will take place only under very exacting conditions. There must be soluble molybdenum and iron and no free oxygen available. These conditions are present within the nodules. Here again, the microorganisms benefit the tree by providing a source of soluble nitrogen, and, in turn, the bacteria and actinomycetes get first chance at exudates. Even more importantly, the nodules protect them from foraging protozoa.

Infections that result in benefits to both parties are called mutualistic. When the benefits are greater than the sum of the parts, the association is called synergistic.

Species of legumes commonly have bacterial nitrogen-fixing nodules and mycorrhizae. The mycorrhizae facilitate absorption of elements, and the nodules provide a nitrogen source. Many species of trees have actinorhizae, which are the nodules formed by the root infections by actinomycetes. Species of *Alnus* have very large nodules. The actinorhizae are common on tropical and subtropical trees, and especially on trees that have adapted to soils low in available elements essential for life.

On some subtropical and tropical trees, such as the macadamia, multi-branched clusters of non-woody roots called proteoid roots form. The proteoid roots alter the rhizosphere by acidification processes that facilitate the absorption of phosphorus-containing ions. When I examined the roots of dying macadamia nut trees in an orchard in Hawaii, I could not find proteoid roots, yet only a few days earlier I had found them on macadamia nut trees growing in the wild. I learned later that the orchard where trees were dying
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An iodine stain (I₂-KI) was poured on half of the sugar maple stem section, left, and root, right. The iodine stains starch purple. Note the greater density of purple in the root over the stem. The iodine stain is a very effective way to determine vitality of a tree. Small cores can be removed with care and checked for starch. The cores should be removed only when a determination of vitality is essential for a treatment. The stain can be poured on small cut woody-root tips to check vitality of trees selected for planting.

was heavily fertilized on a regular basis with phosphorus.

Another type of nodule forms on species of cycads. These nodules harbor blue green algae, or cyanobacteria, that have the ability to fix atmospheric nitrogen.

My point is that many different synergistic associations have developed in, on and about non-woody roots that provide elements, not an energy source. These associations are of extreme benefit to all connected members. At the same time, the conditions that provide for the associations are very delicate and exacting. It does not take much to disrupt them.

It Does Not Take Much to Disrupt Them

This statement deserves repeating and repeating. The delicate "threads" that hold these powerful associations together need to be recognized and respected. Trees in cities grow only so long as these "threads" remain connected.

Trees grow as large oscillating pumps, with the top trapping energy and pumping it downward. The bottom absorbs water and elements and pumps them upward. The
pumps have developed over time to work on the basis of many synergistic associations that maximize benefits for all connected members and to minimize waste. Many of life’s essentials for the bottom associates come from the top of the tree. And, the top works only because the bottom works. Energy is required to move things, and elements and water are required to build things.

**Tree Treatments and the Rhizosphere**

When trees are over-pruned, the top will be injured first. When it is injured, it will not serve the energy requirements of the bottom. Soon root diseases start and are blamed for the decline or death of the tree. Where over-pruning is common, so are root diseases.

Compacted soil blocks air and water to the bottom and crushes all the microcavities where the microorganisms live. In nature, decomposing wood and leaves keep conditions optimal for the rhizosphere inhabitants.

Over-watering stalls the respiration processes in the roots. When respiration stops, carbonic acid is not formed. When carbonic acid is not formed, ions necessary for the absorption process do not form. When absorption is down, the tree system is in trouble. Fertilizers can be of great benefit to trees growing in soils low in or lacking elements essential for growth.

Elements or molecules made up of a few to many different atoms enter the roots as ions. An ion is a charged atom or molecule. Ions with a positive charge are cations, and those with a negative charge are anions. Each particle or granule of fertilizer is a salt made up of a lattice of anions and cations, just as ordinary table salt is made up of a grand lattice of connected sodium cations and chloride anions. When salt as sodium chloride dry granules is poured into water, the sodium and chloride ions separate. When they separate, they carry electrical charges and are called the sodium ion and the chloride ion. When a cation enters a root, another cation must exit. This is very important, as we will see. When nitrogen enters a root as nitrate anion, an anion of bicarbonate ion from carbonic acid exits. The bicarbonate ion is probably the second most important compound in nature, next to water, because it drives the absorption process. When a bicarbonate ion exits into the rhizosphere, the pH increases.

When urea is used in fertilizers as the nitrogen source, the pH in the rhizosphere could increase to 2 or more pH units. The chemistry behind this is complex, but here I present only the conclusion, because a common problem with trees in some high pH soils is chlorosis. There is no easy field method for measuring the pH of the one millimeter wide rhizosphere. The rhizosphere could be pH 8, and the bulk soil would measure pH 6. As pH increases, the availability of elements such as iron and manganese decreases. In soils, it is one thing to have an element present and another to have it in a form available to the plant as an ion. As pH increases, iron and manganese elements form molecules that precipitate in water rather than ionize. If they are not available as ions, they will not be absorbed. And, if they are not absorbed, several of the enzymes essential for chlorophyll formation and photosynthesis will not form.
When the energy flow from the top of the pump is blocked, then the bottom does not get enough energy for growth and defense. The pathogens invade, and the tree declines. This scenario does not mean that every time you use urea, trees will decline from chlorosis. But the use of urea could be a contributing factor where trees with genetic codes for growth on low pH soils are planted in high pH soils. If fertilization is a desired treatment, then a fertilizer that has nitrogen in a positive charged ion, such as an ammonium ion, would help to reduce the rhizosphere pH. When the ammonium ion enters the root, a proton of positive charge will exit. The protons in rhizosphere water will bring about more acidic conditions, so there is a way out.

In summary, fertilizers can be very beneficial for healthy survival of trees planted outside their forest homes. How beneficial will depend greatly on an understanding of many of the points mentioned here, and some basic chemistry.

Primary Causes of Diseases

It is often very difficult to have people recognize the importance of small organisms in small places doing big things. Blame for the death of a tree is often placed on big things that can be seen or felt. Most pathogens are opportunistic weaklings waiting for a defense system to decrease. Many small disrupting events often lead to the decrease in a defense system. Then after the tree has been weakened, the final agent comes along and gets the full blame for the cause. A perfect example is the cankers on honey locust. Flush pruning is usually the real cause.

Pumps and Food

Trees are oscillating pumps. When the pump begins to wobble, some parts will begin to weaken. When they weaken to the point where some other agent causes a part to break, the pump will stop.

It is very difficult to determine where problems start in an oscillating pump. Symptoms may be in the bottom, but the cause may have been in the top. Or, it could be the other way around.

I go back to two points that may be part of the answer: exudates and the self-thinning rule of ecology. All living things require food and water for growth. Leaves and photosynthesis provide the energy at the top of the pump. The nonwoody roots and the rhizosphere provide the elements and water at the bottom. Photosynthesis will not work without water and elements, and the absorption processes will not work without an energy source.

Trees became trees growing in groups in forests where the self-thinning rule had strong survival value. Not only did exudates provide quick energy for the rhizosphere organisms, but the carbon in the wood of the trees that fell to the ground also provided a long-lasting energy source for a succession of organisms.

Reports from some countries indicate an abundance of soluble nitrogen compounds in runoff water and even in ground water. This is a strong indication...
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that the carbon-nitrogen ratio has been disrupted in the soil. It is well established from studies of the physiology of fungal parasitism that the degree of parasitism is often determined by the carbon-nitrogen ratio. It is probably similar for other organisms.

The organisms in the rhizosphere and surrounding soils have many different ways to weather rocks and to get nitrogen and other elements essential for their growth. What they cannot get in the soil is a sufficient energy source. Yes, some small animals die and provide carbon, and some microorganisms can get energy by chemosynthesis, but the requirements for carbon are much greater than what could be supplied by those sources alone. Carbon must come from the top of the pump. When the energy source from the top begins to decrease, the rhizosphere organisms will begin to starve.

The oscillating pump model soon takes on the form of a circle, because now it could be said that the top did not work efficiently because the bottom had a problem first, and this could be so. My point is that the energy problem does play a key role in declines. If a single tree is already very low in energy reserves, it cannot contribute much to the rhizosphere even if the genetic codes rule that exudates should increase as a tree begins to decline. Soon we will be faced with the chicken or egg problem.

I believe there is a way to decrease the potential starvation problem. In forests, more wood should be left on the ground, and in cities, more composted wood and leaves should be added in correct quantities to the soil about the base of trees. Incorrect treatments of pruning, watering, planting and fertilizing should be corrected, because they often start the pumps to wobble. If these simple adjustments can be made, rhizosphere starvation will decrease and our trees will lead healthier and longer lives.

Dr. Alex Shigo is the owner of Shigo & Trees, Associates. He will be the keynote presenter at TCI EXPO '96.

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**Author's Note**

Much of the information presented here has come from several books that I found very helpful in preparing for this article. I recommend these few books to people who want more information.


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This Management Exchange is a reply to a letter from Mr. Pius M.A. Floris regarding a past article by Mr. Howard L. Eckel that appeared in TCI's Branch Office column. Mr. Floris, who runs one of the major tree care companies in the Netherlands, requested more information on what a practical, daily, on-site "Hazard" check would look like. Howard Eckel responds:

When I was general manager of the Davey Tree Expert Company, sales went from $50 million to $129 million in five years. The workforce doubled to 3,500 employees. We operated in 45 states and the Province of Ontario, Canada. We performed just about every type of Green Industry activity in one place or another, and operated approximately 2,200 vehicles—trucks, automobiles, aerial lifts, cranes, trenching equipment and industrial tractors with brush mowers.

With the growth we experienced and the varied equipment we used, you can appreciate the potential hazards we faced. We had an in-house safety department staffed with experienced tree surgeons who were given additional safety training. They spent most of their time in the field, working with our production staff of men and women working as apprentices, climbers, crew leaders and supervisors. All attended weekly "tailgate" safety sessions.

"Tailgate" denotes a brief, 15-minute safety session held at the back of the truck. The material covered was developed by the National Arborist Association, our safety department and the insurance industry.

The most effective part of our safety program was the fact that everyone in management and in supervisory roles—including the chief executive officer and the president—attended intense two- and three-day safety seminars and yearly updates. No one gave safety lip service. By their attendance, among other things, management at every level made it clear to production people that we were serious about preventing accidents.

No matter what job title employees held, they could stop any operation and close it down if they noticed an unsafe condition or act.

I must admit, my original interest in accident control was profit-motivated. If we had too many accidents in any state, we became uncompetitive and our profits decreased. Our workers' compensation rates were set by our accident experience. Our experience was related to the average of every other company doing the same type of work in the state. If a company's accident experience was above the statewide average, its rates went up and it was at a competitive disadvantage.

The average, called the Manual Rate, was different in each state. Delaware, for example, once had a Manual Rate of 10 percent. Firms that experienced the average number of accidents paid 10 percent of their production payroll as a premium to the insurance company. At one time, Minnesota had a Manual Rate of 64 percent. That is, companies paid $64 per $100 of payroll for insurance premiums. Think about the firms that were above the average!

After being close to the human suffering caused by accidents, I broadened my interest beyond money.

Our safety department, with the help of our mainframe computer, tracked accidents by type, crew leader, the particular service and where they occurred. I was floating in a sea of statistics. Everyone was developing an accident history, laying out reports of what had already happened. This statistical data provided a guide for developing our Tailgate Safety material.

Accidents are a result of an unsafe condition or situation or because of unsafe acts by people. We began to cut our accidents when we began to focus everyone's attention on why an accident occurred in the first place.

Statistics from the insurance industry are irrefutable: For every 33 unsafe acts by people. We began to cut our accidents when we began to focus everyone's attention on why an accident occurred in the first place. Statistics from the insurance industry are irrefutable: For every 33 unsafe acts or conditions, there will be three minor accidents and one major accident. Our goal was to reduce the number of unsafe acts and conditions to under 32!
The Unsafe Condition

The unsafe condition is somewhat easier to manage than the unsafe act. At least, it seemed to take less time for us to get it under control. I recommend you sort out your accidents by type and service performed.

- List the types of accidents your people experience while performing tree surgery, tree removals, insect and disease control, tree planting and other major revenue-generating items.
- Pay particular attention to equipment being used when the accident happened.

After studying accident reports, I decided to take 30 cranes away from 30 different operations. Originally put into use to aid in developing our tree moving business, the cranes were instead used for tree removal, where operators untrained for working around electricity were sticking the booms and boom jibs into the wires. The results were horrible: fatalities or people with their feet burned off.

I was not popular with local managers for taking away one of their toys, however, the action had an unforeseen benefit. Without cranes, our tree removal business tailed off and our surgery and plant health care business expanded. Since these services had higher gross margins than removals, after a time the managers forgave me. More importantly, our accident costs went down—a double positive in the right direction.

After you have the accidents tallied by type and service, you can determine if there are any patterns—by accident type, by particular service and/or by crew. Regardless of whether patterns are present or not, you will have a list of things that happened while your crews performed certain types of work.

From this information a list—a "Hazard Check Sheet"—can be developed for each type of job and distributed with each work order. We instituted a mandatory policy whereby the crew leader would walk the crew around the job site, outlining the work to be done. While discussing the task of the day and specifically how it would be accomplished, safety issues and past catastrophes would be mentioned.

The Unsafe Act

This is a more difficult problem to correct. It takes more time, training and experience and long-term dedication to educate workers to follow safe practices. There are no shortcuts. About the only worthwhile use for past statistical history is that it indicates to management who needs additional training in which areas.

As general manager, I was faced with a tough logistical problem. We were hiring all over the country. People claimed they were experienced, yet out on a job we found out that their experience was mostly in how to have an accident.

Here's how we reduced accidents among new hires.
- We assumed that everyone was inexperienced until local management determined otherwise.
- We profiled our experienced crew leaders. Who were the best trainers and teachers? Not everyone has the aptitude and patience to cope with inexperience.
- We started keeping statistics broken down by crew. Who always needed new people? A weak crew leader can create high turnover.
- We always tried to place the new employee with the best crew leader/trainer. In the meantime, we would move a top

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climber over to the crew with the vacancy if that crew leader was not a trainer or was having a lot of turnover. In many cases, it was not long before the top climber became the crew leader.

- We developed an “Absorption Statement,” which was a step-by-step outline of what the new hire needed to learn. It also served as a teaching guide for the crew leader.
- We enlisted input from all existing staff. We asked them to list the first 10 things that should be taught. And the next 10.

I eventually took their input and used it to develop job descriptions and specific responsibilities for each job category in our company, including mine.

Tree and shrub identification were included in the lists of 10, along with safety and training seminar material. We utilized educational tapes from the National Arborist Association and International Society of Arboriculture. People progressed at their own speed and could and did level off, deciding on their own when they didn’t want to take on more.

With everyone involved, there was enthusiasm for the new hire to succeed. We had created a positive atmosphere for the new hire by involving everyone.

In a related area, we had been conducting periodic crew leader evaluations for years. We also had been conducting yearly training seminars for our field supervisors. Every year, about half of them were brought into the home office and run through a list of items by various staff department personnel. From equipment and safety to customer relations and personnel, you name it and we tried to cover it. It dawned on me at one session that one supervisor in the audience knew more and was more successful in the topic discussion that the staff person trying to cover it.

From this, came two new policies. We started conducting evaluations, and started bringing in only those in need of additional training in specific subjects. We didn’t bore experienced, knowledgeable supervisors by requiring them to sit in on sessions covering topics they knew more about than the person teaching them.

The second action was a no brainer! Supervisors who were proficient in particular subjects replaced headquarters personnel in conducting the classes. Peers teaching peers generates more interest. People began to set personal goals. “Some day I am going to be a teacher at these seminars. I am really going to become proficient!”

Did it work for Davey Tree? Our accident experience rate went down. We eventually shaved hundreds of thousands of dollars off our workers’ compensation insurance premiums, which had been costing about around $7 million a year.

The employees purchased the company the year after I started as general manager. In the next five years, we increased our sales volume, and increased profits fourfold while investing $36 million in the fleet. We paid off three-quarters of the bank debt incurred in purchasing the company and even built a new $4 million office.

A lot of good things had to fall into place for this to happen. I believe that positive fallout from our efforts to reduce unsafe acts and conditions had a lot to do with transforming a far-flung group into a closer, better trained and more profitable, working company.

Work safely!

Howard L. Eckel is currently a management consultant to the Green Industry.

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By Peter Hopkins, Marketing Manager, New England Ropes

Rope has been used as a tool for thousands of years. One can only assume that not long after man started to climb trees, ropes became one of the first tools used.

In the beginning, ropes were made of natural fibers in three or four strand laid construction. This type was also used for other purposes, ranging from general lifting to ship mooring lines. One of the major problems with natural fiber ropes, however, was the inconsistencies caused by moisture and age. As a lifeline, an alternative was needed. Ropes made of synthetic fibers began to gain popularity during the early 1940s with the availability of nylon and polyester. The option of choosing fibers with different characteristics to produce a specific type of rope signaled the beginning of the synthetic rope revolution.

The first synthetic rope designed and manufactured specifically for arborists was made by New England Ropes. A polyester and nylon three-strand rope, the design called for polyester on the outside for durability and blue nylon in the core for elongation. A firmer lay was required to keep bouncing and hockling to a minimum. The nylon core of each strand was dyed blue to act as a warning flag if the rope had excessive wear or damage. This rope was patented and named Safety Blue in 1972. For the first time, arborists were recognized as a group that required a rope with specific properties.

In the middle 1970s, the first braided rope was manufactured specifically for arborists. It had 16 strands, each made of polyester, plied over a polyolefin core. To keep the rope from becoming flat when knotted, the core was filled with parallel blue nylon yarns. As in the three-strand rope, the blue was used as a safety flag in case of excessive wear or damage to the cover. This rope, produced by New England Ropes, was called Braided Safety Blue. At about the same time, Samson introduced a 12-strand construction called Arbor-Plex. Compared to three-strand ropes, braided ropes were easier to work with, felt “broken in” immediately and did not spin or hockle.

Braided ropes gained in popularity very quickly and within 10 years were an industry standard. The next innovation came in the mid 1980s when New England Ropes coated Braided Safety Blue with an orange urethane as a way of designating the line as a critical climbing line. The colored climbing line was born. In the late 1980s, New England Ropes continued the colored rope idea with the introduction of Braided Safety Blue Hi-Vee. The construction was the same as Braided Safety Blue but with a dyed orange and white cover pattern. At about the same time Samson introduced an all-blue rope and named it True Blue. Since that time, every major manufacturer has produced a climbing line in a color other than all white.

Most recent changes have adapted existing rope to meet the needs of the new climbing techniques. Many climbers use the “split tail system,” which requires a spliced eye in one end of the climbing line and a splice in the end of a short separate piece of rope for the “tail.” A splice developed for 16-strand ropes and for some 12-strand ropes allows this technique to be used. Future changes may encompass lighter weight, more durable and better handling ropes. New generations of nylon and polyester, as well as some materials not yet available, will allow additional improvements. Rope manufacturers will continue to improve performance and safety to make rope the one tool you can use with total confidence.
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The SwapLoader Model SL-125 has a 12,000-pound capacity with a water tank. Shown here, the tank is being off-loaded to swap on a dump body.

Southco chip bodies may be installed with a variety of tool boxes. Note the side air exhaust vents.

The Arbortech 14 foot chip body holds 18.9 cubic yards in its galvanized steel, die-formed body.

The Critical Role of Trucks in Arborists' Daily Success

Schodorf's removable aluminum roof features a dust release system that channels dust away from the chipper.
A rborists love their equipment, and no pieces of machinery are as important to a profitable tree care company as its trucks. Fortunately, the companies featured here have made a comprehensive effort to understand the needs of arborists and adapt standard truck bodies and features to those special requirements.

From small 9-foot models that maneuver easily in tight urban settings to 20-foot forestry bodies designed for hauling large logs, the selection has expanded in recent years. And even within truck classes, special options fabricated after input from arborists offer a versatility from one truck that might have required two or more in years past to accomplish the same job.

It would seem somewhat irresponsible of us to have an article about big, shiny trucks without mentioning that they don’t drive like cars. Picture it: Your employee glides into the company parking lot in a car weighing 3,000 to 4,000 pounds, a veritable jackrabbit of a motor vehicle. He gets some coffee, shoots the breeze, loads some tools, picks up orders and keys, and slides behind the wheel of something that weighs 10,000 to 26,000 pounds. Compared to his jackrabbit, this is a rhinoceros!

How do you protect your workers and the public, reduce a major cause of liability and overhead for your company and keep your trucks looking new longer—all at the same time? Well tell you: You need driver training.

One would think that the greatest hazards an arborist faces would be on the job, not in getting to the site. Yet injuries and property damage in vehicle accidents top the list of insurance claims for tree companies, according to loss control specialists at ITT Hartford.

So, do your homework before you buy a new truck to ensure that it is the model that will best fit your specific needs. After you buy that new piece of equipment, take steps to lessen the chances that you or your employees will take the shine off the paint job in dramatic fashion.

Purchasing a truck for your business can be an agonizing decision. The purchase price, which is usually foremost in our minds as we make comparisons, may actually turn out to be one of the least important considerations. The manager must look at the truck in terms of crew productivity, billable hours, maintenance costs and serviceability.

We have attempted to make your next purchase a little easier by assembling information from some of the premier truck body manufacturers catering to the tree care industry. The information contained herein should not be construed as an endorsement of products.

Arbortech

Arbortech produces a complete line of forestry bodies for the professional arborist: chip bodies, crew cabs, brush bodies, pickup caps and tool boxes.

The Arbortech Chip Body helps maximize efficiency while reducing operating and maintenance costs. Its design combines strength and durability with quality, professional styling. It comes with or without a cut-out, removable top, and in lengths ranging from 9 to 16 feet. Galvanneal steel is used in all fabricated parts, and formed ribs in the side and top panels increase strength. The tool box boasts a tamper-resistant security system, and Arbortech provides a 3-year no rust warranty. A variety of options allows for customization.
Arborists' Trucks

to best fit your company's needs.

Arbortech's Utility Tree Vehicle (UTV) offers the versatility you need and a myriad of options. As a chip truck, the UTV carries a heavy load of chips with ample space for tools. Remove the sectional roof and the body converts into a dump truck. Without the sides and roof, it converts into a platform spray body. Available in sizes ranging from 9 to 16 feet, the UTV is a useful body for companies with many different needs.

Schodorf Truck Body & Equipment Company

Founded in 1881 by A.C. Schodorf, the fourth generation now directs the daily functions of Schodorf Truck Body & Equipment Company. Forestry body production started in 1944, and today the company manufactures a complete line of truck bodies that will fit the particular needs and scope of services of every tree care company.

For example, when installing and pruning ornamentals, the 10-foot body with a removable aluminum roof will transport the new tree. Arborists may then proceed to the next job, with the roof installed, and

One of Schodorf's most popular options is a liftgate to ease loading of large logs.

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chip into it the rest of the day. This size is also handy for side-loading mulch or top-soil for landscaping needs. The 12- and 14-foot bodies are popular for tree maintenance crews. These models provide more cubic yard capacity, and are installed on a heavy-duty chassis that will pull a larger chipper. For land clearing, the 16- and 18-foot bodies save trips to the landfill and allow for high production in case of storm damage and other emergencies.

Popular options include removable aluminum roofs, liftgates and corner-mount cranes. Schodorf’s dust release system was designed to exhaust the unwanted dust away from the chipper. This keeps the radiator fins cleaner which allows the engine to operate cooler. It also reduces the dirt and dust that the person feeding the chipper must breathe.

One of Southco’s many optional features is a Prentice Log Loader.

Southco Industries, Inc.

Southco is the largest forestry body manufacturer. Its forestry bodies come in all dimensions. A unit can be as simple as a pickup truck with a plywood box nailed together to form a body, or as complex as a tandem axle class 8 tractor with a 40-cubic-yard galvannealed dump body. Each unit can be installed with tool boxes to carry all the equipment required to do most types of tree care work.

For small jobs, Southco produces a 10 cubic yard chip body manufactured to mount on a 1-ton chassis cab. The 1-ton model, as well as all Southco bodies, comes in a multi-purpose version with removable tops and sides. This package gives the operator one truck that can be used for several applications.

While the 1-ton model is flexible, Southco sells more medium-duty chassis cabs with either a 14-foot standard chip dump body or a multi-purpose package. For projects that require larger payloads, a 30-cubic-yard forestry body is available that is 16 feet long.

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crossbody and underbody tool boxes, hitches, trailer light connectors and hydraulic dump hoists. All units are manufactured from galvannealed material.

Standard features include: chipper air exhaust vents that allow air to escape out the side of the body; a lever-type tailgate latch that won't bend under heavy load pressure; weatherstripping around the perimeter of every toolbox; and swivel rope hooks.

Optional features include: signal boxes and wheel chocks; National knuckle boom cranes; liftgates; Prentice Log Loaders; Ford, GMC and International chassis cabs.

SwapLoader U.S.A., Ltd.

SwapLoader offers the tree care industry a unique system that does the work of a roll-off hoist with none of the common drawbacks. The unit mounts directly on a chassis, allowing arborists to swap bodies quickly. Several trucks can be replaced by one unit by using interchangeable bodies. When installed, SwapLoader operates in two basic models—as a dump truck and as a mount/dismount system for a variety of bodies.

Two levers allow the operator to hook and mount truck bodies in less than a minute without leaving the cab of the truck, which is both convenient and safer.

Hook-lift hoists are available in 9,000- to 65,000-pound capacities. Hoists accommodate truck bodies from 10 to 24 feet, depending on the model of hoist. The newest hoists, the SL-405 and SL-545, utilize the same frame and design and size. This means that an upgrade from the 40,000-pound capacity 405 to the 54,000 pound capacity 545 entails only an exchange of a few hydraulic components. For the truly large jobs, the new SL-655 can handle 65,000 pounds.

Summary

With the advent of galvannealed steel several years ago, today's trucks last years longer. (A positive development given the rising purchase price.) A repaint every so often coupled with a comprehensive maintenance program should keep the truck and body in working order and projecting a professional image for years to come.
Safe Truck Operation Saves Lives and Money

In November 1995, the National Highway Designation Act of 1995 repealed the national speed limit and allowed vehicles with a gross vehicle weight rating of between 10,001 and 26,000 pounds to be exempt from the Federal Motor Carrier Safety regulations.

While the new regulations have not been spelled out in detail, presumably this could result in some tree care companies no longer being required to obtain prior-employer references, conduct pre-employment and periodic physicals, obtain Motor Vehicle Record checks, periodically review the driver's record to verify current qualifications status or limit hours of service. It would also effect requirements for accident reporting and vehicle maintenance.

After a decade of improving traffic accident statistics, drivers have reversed the pattern. In 1992, 39,250 traffic fatalities occurred; in 1993 there were 40,155 - a 2.3 percent increase. 1994 had 40,855, another 1.7 percent increase. In 1995, fatalities were up another 2 percent.

What can you and your driving employees do to keep from becoming one of the statistics?

1. Probably one of the most important factors is to decrease the stress by taking some of the time pressure off of the task of driving.
2. Use caution when turning right on red. Studies show that 'red light runners' are younger, less likely to wear seatbelts and had poorer driving records than those who obey traffic signals. You and your drivers need to be on the lookout for these aggressive risk-takers whose time is more important than their (or your) life.
3. Speed is a still a killer. Don't condone driving over the speed limit. Take a strong stand to let your employees know you will not tolerate use of radar detectors while on company business. No business is so important that you have to speed to arrive and gamble with your life. Set a visible example for all to emulate. Encourage the use of seat belts.

4. Promote defensive driving skills through company newsletters, payroll stuffers, bulletin board items, company-sponsored defensive-driving classes and discussions with employees who have poor records. Make your good drivers into better drivers. Help them maintain an accident-free record.

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'Tis the Season

October is a very important month for tree care companies. Now is the time to prepare for the next six months of potentially adverse winter driving. Drivers and vehicles alike need to be prepared for the cold, often slippery conditions that will become their operating environment.

If your employees will be operating in these conditions, you should be considering conducting some "winter awareness" training sessions. Posters, payroll stuffers, "tool box meetings," one-hour conferences on the hazards of winter driving—all will increase driver awareness of the hazards and how to prepare for them. Every year, the first snowfall seems to bring an unprecedented rash of accidents. It's as though no one has ever seen or driven in the "white stuff" before. Get drivers to anticipate the bad driving conditions before they are involved in that first winter accident. Start preaching slower speeds and larger "space cushions" as well as earlier starts, so they have more time to make their destination. Don't forget the advantage of making your vehicle more visible by putting on headlights early and when weather conditions reduce visibility.

It is just as important to make sure vehicles are ready to cope with the weather. Now is the time to check tires for tread depth and air pressure. Vehicles need to have their windshield washer reservoirs filled with the proper anti-freeze solutions, and drivers issued brushes or scrapers for their windows. Electric heaters for engines, mirrors and defrosters need to be checked for proper operation. Radiators need to be checked for antifreeze, and that always brings up the issue of leaking radiator hoses. In some parts of the country, carrying a shovel and several bags of sand or ice-melt is a really good idea.

While winter operations often are an added burden, they can be made less painful through good, solid preparation. Most of the problems can be dealt with through advanced planning, but lack of planning and preparation can make relatively minor weather problems become serious ones.

Try Training

The Department of Transportation may mandate training if some of your drivers are required to have commercial drivers licenses. Drivers must hold a CDL if the vehicle they drive is in excess of 26,000 GVW, or if the combination of the vehicle weight and 10,000-or-more-pound trailer is in excess of 26,000 pounds, or if they are transporting placarded hazardous materials. CDL holders are also subject to drug and alcohol testing. Check with your state Department of Transportation, as some states have expanded on or slightly altered these federal requirements.

We would like to thank the Loss Control Department of ITT Hartford for this information.
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Where Have All the Good People Gone?

Innovative strategies for finding and hiring employees

By Peter Sortwell

People often ask me where my company finds its “good people.” My response is to ask them to define good people. Their answer usually includes those who show up for work every morning, wear their hard hats, follow safety rules, do quality work and provide excellent customer service.

Those people do not exist! Well, they exist, but those are the people who climb the corporate ladder as fast as they climb a tree. Or, they are running their own company and trying to figure out where the good people are.

Let’s face it, the pay scale is nowhere near what it should be. We would all like to pay our employees and ourselves more money, but companies in our industry can only raise prices so far before we become non-competitive. It’s slowly getting better, and the more good people we can bring into the tree care industry the more productive and efficient we will become. That will result in higher margins.

Great employees were not born to climb trees or feed a chuck and duck drum chipper all day with dead brush. Tree care can be tough, grueling and unrewarding work. Nevertheless, there are ways to find and develop good people through the recruitment process.

By industry standards, Arbor Care is a large tree company. We employ more than 200 people and produce revenues in the millions of dollars. If it were not for the lack of qualified people, I believe that Arbor Care, or any other company that had the desire to grow and expand, would be twice as large. It’s not a lack of work that is holding us back, it’s a lack of people.

There are no storks delivering trained, capable tree workers to my front door. Once in a while, a great employee walks into the office, but

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1. Gaps in employment history
2. No reason given for leaving an employer
3. Reason for leaving is “personal”
4. Short employment periods, also known as “Job Hopping”
not often enough to keep up with the demand in most situations.

We try to be more creative in looking for people.

We try to be realistic as to who is going to do this work, and when we find a labor pool willing to accept the work and wages that our industry offers, we try to be aggressive in pursuing that labor pool.

Many people tell me that Arbor Care has it easy because in California we have a large Hispanic workforce. We have offices throughout the country, and we have Hispanic workers at every one of our offices. We have been aggressive in pursuing that labor pool through recruitment.

Here is what a recruiting plan looks like. See how it might fit into your company's plans.

Devising a Recruitment Strategy

While challenging, recruitment need not be overly difficult. A crack work force can be assembled and maintained if employers are willing to be flexible and take the time to devise a recruitment, selection and employment strategy that:

- Is clear, consistent, objective, and centralized.
- Reflects a firm grasp of the number of people and skill mixes needed.
- Addresses the competition aggressively and creatively.

The most effective recruitment strategy is well-managed, cost-effective, tailored to particular company needs, able to meet affirmative-action or equal-employment-opportunity goals, and—through innovative use of both tra-
additional and non-traditional recruitment methods and media—is designed to yield sufficient numbers of qualified candidates for each type of position available.

How-To Strategy
To devise a recruitment strategy that will accomplish your objectives, you must first:
- Decide how much recruitment is necessary. Project staffing needs, factoring in normal attrition, scheduled or likely retirements, company plans for new services and other factors that might affect staffing needs.
- Set a budget that reflects and adequately supports the level of recruitment activity proposed.

Where Do You Find Good People?

1. Newspapers
2. Magazines
3. Trade Journals
4. Radio
5. Television
6. Employee referral programs
7. Outdoor posting of openings
8. Walk-in unsolicited resumes
9. Employment agencies
10. Executive recruiters
11. Out-placement companies
12. College recruitment programs
13. College placement offices
14. Direct contact with college faculty
15. Placement services provided by professional societies
16. State employment services
17. Job training programs offered by government agencies
18. Company-sponsored job fairs
19. Files on previous job applicants
20. Internal resume files
21. Proprietary schools offering business skills training
22. Co-op or student intern programs
23. Competitors
24. Directories
25. Mail list companies
26. Recruitment advertising firms
27. Tele-recruiting
28. Cold calling (use third party to avoid divulging company)
29. Voice mail response
30. Open house recruiting
31. Employee incentives for referrals
32. Community events
33. Community projects
34. Community events
35. Community events
36. Flyers (door hangers)

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Make sure that each job requisition includes an up-to-date and detailed job description, a list of basic prerequisites and desired qualifications.

Identify the internal and external recruitment methods, techniques and media that are most likely to attract candidates. In deciding on appropriate recruitment methods, consider company location, local labor market conditions, costs (how far the recruitment budget can be stretched), pay and benefits (increasingly important to applicants) and the image the company wishes to project to the public.

Use a group of recruitment techniques, rather than a single method, to meet recruitment goals.

Commit the resources necessary to support the proposed recruitment activities. For example, make sure recruitment literature is appealing and geared to the target audience.

Involve line managers in the recruitment process by encouraging regular contact with recruiters and employment office personnel and ongoing review of pre-screened resumes and applications.

Make sure that everyone who might come into contact with a prospective candidate is aware of and informed about Equal Employment Opportunity requirements and restrictions.

Regularly monitor recruitment activities, so that efforts can be made to eliminate or improve methods or procedures that prove ineffective.

Establish recruiting goals.

1. Decide on the quality and quantity of candidates needed.
2. Determine needs by job title and level in the organization.
3. Stay informed of job market conditions.
4. Develop recruiting materials.
5. Record quantity and quality job applicants produced by various sources and methods of recruiting.

Follow-up on hired and non-hired applicants to evaluate recruiting efforts.

Use the qualification level of applicants to determine training needs.

Consider department/division abnormal attrition rates.

Use applicant routing, invitations, interviews, offers, acceptance, rejection.

Contract Recruiting

In industries where employment is cyclical, employers may be able to make

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Tree Care Industry - October 1996

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Recruitment Budget

<table>
<thead>
<tr>
<th>Service</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>Recruitment advertising</td>
<td>21</td>
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<tr>
<td>Recruiter's and candidate's travel expenses</td>
<td>5</td>
</tr>
<tr>
<td>Employment agencies/Executive recruiters</td>
<td>12</td>
</tr>
<tr>
<td>Relocation expenses</td>
<td>11</td>
</tr>
<tr>
<td>Printed materials (recruitment brochures, application forms)</td>
<td>3</td>
</tr>
<tr>
<td>In-house employment staff compensation, equipment and overhead</td>
<td>37</td>
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<tr>
<td>Miscellaneous</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100</td>
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</tbody>
</table>

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Reception of Applicants

Courteous, professional treatment of, as well as a sincere interest in, job applicants is desirable at all times, regardless of labor market conditions and staffing needs, and regardless of whether applicants are walk-ins, referrals or are responding to classified ads. The reception given applicants can have a considerable effect on community perceptions of an employer and will be reflected in both the number and quality of applicants. Anyone who comes into contact with a prospective applicant—whether a receptionist, interviewer, personnel manager,
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hiring manager or another employee—should be pleasant and exercise discretion when responding to job inquiries.

Employment offices, and especially waiting areas and rooms set aside for pre-screenings or interviews, should be attractive and readily accessible to job seekers.

Telephone inquiries about possible job openings should be handled with care. If calls are routed through the company’s main switchboard, the operator should be instructed as to the proper response. It should not be the operator’s function to inform callers about the availability of openings. If a caller is told that there are no vacancies and later learns that the company was hiring, legal problems could ensue.

Letters of application, whether or not solicited, should be answered promptly and courteously, not merely filed in a resume drawer. Taking the time to respond to queries about job vacancies is a good business practice that can help to create positive feelings toward the company. Candidates appreciate an acknowledgment letter or card, which can save them time if no job openings exist. Ignoring queries can generate anger and frustration, create the impression of disorganization, indecisiveness or poor management and generally foster a less-than-desirable image of the company. If volume warrants, a set of form letters should be

What Discrimination is Forbidden?

Federal law prohibits employment discrimination based on race, color, religion, sex, age, national origin, citizenship status and disability. Virtually all employers are affected by the requirements of at least some of these laws. Federal government contractors and subcontractors have an additional obligation to maintain written affirmative-action plans for the employment of minorities and women and are obligated to make special provisions for veterans and individuals with handicaps.

Federal fair employment practice laws include the following:

**Title VII of the Civil Rights Act of 1964** prohibits discrimination in any aspect of employment, including “help wanted” advertising and pre-job testing, on the basis of race, color, religion, sex, or national origin. In 1978, the Pregnancy Discrimination Act amended Title VII to prohibit bias on the basis of pregnancy. Employers of 15 or more workers are covered by Title VII.

**The Equal Pay Act of 1963,** part of the Fair Labor Standards Act, prohibits pay differentials based on sex.

**The Age Discrimination in Employment Act of 1967** prohibits employment discrimination against individuals aged 40 or older. It applies to employers of 20 or more workers.

**Section 503 of the Rehabilitation Act of 1973** prohibits discrimination against handicapped persons by federal contractors. Employers are required to take affirmative action in hiring qualified individuals with disabilities.

**The Vietnam-Era Veterans’ Readjustment Assistance Act of 1974** requires affirmative action by government contractors to employ and advance in employment qualified veterans of the Vietnam era and disabled veterans.

**The Immigration Reform and Control Act of 1986** prohibits employers from discriminating on the basis of citizenship status or national origin. The Act’s provisions do not apply to illegal aliens, and there are exemptions where citizenship is required by law.

**The Americans With Disabilities Act of 1990** prohibits discrimination against individuals with disabilities and requires places of public services and accommodations to be usable and accessible. Employers with 15 or more workers are covered.

**State Laws:** In addition to the above federal laws, most states have enacted laws prohibiting discrimination on the basis of race, religion, sex, national origin, age or handicap. Many of these laws are more comprehensive and restrictive than comparable federal legislation.
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designed to respond quickly to individuals who express an interest in employment. Preprinted reply cards also are very useful.

The resumes and completed applications, including those considered but not selected for existing vacancies, should be kept on file separately from current employee information to facilitate review when new jobs open. Employers are required by law to maintain hiring records for three years.

Interviewing Guide

The setting for any interview is important. While you are appraising the applicant, the applicant also is appraising the company and making comparative judgments about all the other organizations to which he or she may have applied.

A pleasant and comfortable office should be reserved, so that interviews can be conducted in private. There should be no distractions, such as ringing telephones, and arrangements should be made to avoid interruptions that interfere with the flow of information and the rapport established with the applicant.

Avoid personal bias. Be objective when assessing an applicant’s strengths and weaknesses. If you are experiencing any negative feelings toward an applicant, try to determine why you feel the way you do. It may be that the applicant really is a poor job candidate, or simply that you are allowing personal preferences to cloud your judgment.

Advanced planning will provide for an effective interview. Review the applicant’s application before the interview; schedule sufficient time to complete the interview (approximately one hour); take notes unobtrusively of the applicant’s responses; and concentrate on listening.

The interview should contain the following elements:
1. Introduce yourself and state your position in the company. Inform the applicant that you may be taking notes during the course of the interview. A good introduction will put the applicant at ease and lead to a more successful in-
terview.
2. Offer a brief statement about the company and the title of the available position.
3. Ask the structured interview questions attached to this guide.
4. Give an accurate job preview and description of duties.
5. Explain the interviewing process and when the applicant can expect an answer.
6. Conclude the interview by thanking the applicant for sharing his work experience and education.

Summary
The good people you need to operate your business do exist. The keys are knowing where to look, how to get their attention and how to attract them to your company. The more applicants you generate, the better your labor pool from which to choose your next hire. But don’t expect these people to walk into your office or form a line outside your door after one ad in a local paper. Good people don’t grow on trees.

Peter Sortwell is general manager and vice president of Arbor Care of San Jose, CA.

The Dos and Don’ts of Interview Questions

You may ask:
♦ if an applicant uses another name or nickname, but not her maiden name.
♦ for a place of residence, but not whether an applicant owns a residence.
♦ whether an applicant is over 18 years of age, but not his age.
♦ whether an applicant has a legal right to work in the U.S. after an offer of employment is extended, but not his birthplace, citizenship or mother tongue. Nor may you require documentation and/or completing I-9 before a job offer.
♦ which languages the applicant reads, writes or speaks if it is relevant to the job for which applicant is applying. You may not ask how the applicant acquired an ability to read, write or speak a foreign language.
♦ if an applicant can perform the essential functions of the job with or without accommodations, but not about general medical condition, state of health, illnesses or disabilities.
♦ name and address (but not the relationship) of person to be notified in case of accident or emergency.

You absolutely may not ask about the applicant’s:
♦ marital status.
♦ number and/or ages of children.
♦ provisions for child care.
♦ pregnancy plans.
♦ color, complexion or color of skin, eyes, or hair.
♦ height or weight.
♦ days absent in previous job.
♦ treatment for alcoholism or drug addiction. (You don’t have to hire them if they fail the drug and alcohol test.)
♦ workers’ compensation claims.
♦ religion or religious holidays observed, though you may offer a statement of the regular work days and hours to be worked.
New Products & Services

Eaton Corporation recently introduced the Eaton Fleet Advisor, an integrated fleet management system that is a combination of hardware and software comprising an on-board truck system and off-board ground support system. The system automates fleet processes such as vehicle and driver routing and scheduling, vehicle tracking, trip recording, DOT logs, state mileage recording, vehicle inspections and more. Fleet Advisor consists of two basic elements: an On-Board System in each truck, and a Ground Support System at the fleet operations center. An on-board computer with a large touch screen offers a user-friendly, icon-assisted interface to the driver to interact with the fleet operations center with the touch of a finger. The Fleet Advisor system is made up of a Basic Advisor, the core of the system, and many ancillary Advisors. The Basic Advisor provides the framework for the Activity Advisor, Tracking Advisor, Resource Advisor and Maintenance Advisor to function. Contact: Eaton Corporation, 6209 Ramada Drive, Clemmons, NC 27012 or call 1-800-423-1525 or 910-712-2160.

Speed Stakes from Better Bilt Products, Inc., are ideal for anchoring newly planted trees, even in light or sandy soils, or soils still settling after filling or landscaping. The patented Speed Stake, with 10-foot soft strap cables, was designed to provide superior holding power at a lower cost than telephone-pole anchors. The soft straps will not harm the tree and do not require hose, tubing or cloth padding to prevent injury to the tree bark. Further, they are readily lengthened for tree growth or tightened because of settling. A special driving rod holds the stake and keeps it straight. After driving into solid soil, the rod is pulled out, slipped through the wire eyelet, which is then pulled or pried up three or four inches. This causes the stake to turn in the soil, anchoring it solidly. For information, contact Better Bilt Products, Inc., 3234 S. Clev-Mass Rd., Norton, OH 44203, phone 708-543-6767, fax 330-825-6750.

The EAGLE S-42 from AmeriQuip is a trailer mounted, telescopic design aerial lift with a 31-foot side reach and 42-foot working height. It features positive bucket leveling, 360-degree continuous rotation and offers outstanding portability for easy access to a variety of maintenance tasks. Fully proportional control valves with neutral position interlock allows simultaneous two-function operation and complete feathering capability. Heavy-duty, quick-adjust outriggers are an integral part of the lift. A gas engine is standard, and a 24V electric power option is also available. For information, contact AmeriQuip, 1480 Arrow Hwy., La Verne, CA 91750. Phone: 800-824-9776; Fax: 909-392-4651.

Shindaiwa recently introduced a new line of grass trimmers and brush cutters that are designed to run cleanly and to offer: full anti-vibration systems for reduced fatigue; high power-to-weight ratios; chrome-plated cylinders; two-ring pistons; one-piece electronic ignition for easy starts; and TK and Walbro carburetors for excellent power from clutch engagement through full throttle. The 350 series offers the greatest power-to-weight ratio in their class. The next most powerful, the 270 series, develop 1.5 horsepower with 27.2 cc and a dry weight of 13.7 lbs. The 260 series also offer the highest power-to-weight ratios in their class. The T260 grass trimmer and the C260 brush cutter are constructed with the same tough durability as the 250 series, but with a lot more power and features. The 230 series offers a displacement of 22.5cc, 1.1 horsepower and weights ranging from 9.5 lbs for the grass trimmers to 10.1 pounds for the brush cutters. Contact Shindaiwa, Inc., 11975 SW Herman Road, Tualatin, or phone 503-692-3076.

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ImpleMax Equipment Co., Inc., has added grapples that feature built-in winches to its line of tractor grapple attachments. The new unit combines two of the most useful skidding tools into one compact unit: a winch and a grapple. The addition of a winch allows an operator to pull in material from difficult-to-reach spots and then pick up large loads with the grapple. The tractor grapple is form-constructed of heavy gauge plate and T1 steel. Its tongs can grasp from 3 to 30 inches in diameter. All hydraulics are self-contained on the unit, so that only two remote circuits are required to perform the three basic functions. Winches are available in a 9,000- or 12,000-pound capacity and can handle up to 185 feet of cable. For more information, call 800-587-6656 or write ImpleMax Equipment Co., Inc., PO Box 549, Bozeman, MT 59771.

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A new 64-page catalog from WesSpur, Inc. combines climbing products from the tree care industry, search-and-rescue and sport climbing. Manufacturers from the U.S. and Europe are represented. This cross section offers the professional climbing tradesman a wide variety of products meeting his individual needs and style of climbing. No other catalog represents such a wide variety of climbing products. Products are organized into easy-to-read chapters. Items include books, saddles, rope, lanyards, ascending and descending, clips and links, slings, winches, pulleys, rigging and personal protection. All products meet ANSI A10.14 standard for climbing and fall arrest products. For more information, contact WesSpur Tree Equipment, Inc., 2111 Lincoln Street, Bellingham, WA 98225, Phone 800-845-1213, Fax 206-733-6311.

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Arborist Organizations Merge

During the 72nd annual meeting of the International Society of Arboriculture (ISA) in Cleveland, OH, members of the Society of Municipal Arborists (SMA) and the Municipal Arborists and Urban Foresters Society (MAUFS) agreed to merge. The merger was approved by a unanimous vote of all MAUFS members present; SMA members had voted prior to that meeting.

The merger represents a milestone in the advancement of municipal arboriculture and urban forestry. The combining of the organizations' human, technical and educational resources will assure that trees in cities and municipalities realize the full potential of their aesthetic, environmental and economic contribution to urban and suburban society in the future.

Ralph Sievert, President of MAUFS said, "This historic accomplishment signifies the unity of purpose that will be the hallmark of this united organization."

Bob Benjamin, president of SMA stated, "The will of the membership of both organization has been accomplished. I look forward to a stronger, more vibrant, progressive professional organization as a result of this historic achievement."

The membership of both organizations expressed their recognition of the professional benefits to be derived as a result of this merger. The officers, executive boards, various committees and individual members have all worked cooperatively in a give and take manner to make this possible. A name for the organization has yet to be decided.

Draft Standard Available

The final draft of a new national standard for fertilizing trees and other woody plants, part of the Standard, ANSI A300 for Tree Care Operations - Tree, Shrub and Other Woody Plant Maintenance - Standard Practices, is available for public comment.

The document covers general requirement, definition of terms, timing of applications, methods of application, types of fertilizer and fertilizing sensitive trees.

The 60-day public comment period for this latest installment for the A300 Standard officially began on September 13. Individuals and groups interested in reviewing the draft before it is adopted as a national standard can obtain a free copy by requesting one in writing from the National Arborist Association, ANSI A300 Secretariat, PO Box 1094, Amherst, NH 03031-1094, or by fax to 603-672-2613. Comments on the draft should also be submitted to the same address before November 12, 1996.

The ANSI A300 Standard has been developed by a committee of tree care and landscape professionals. The first section of the standard, published in 1995, deals with pruning trees and other woody plants.

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Rip Tompkins
New England Chapter
Bark Buster Tree Service
Weston, MA
Rip took top honors in 1996 by placing first in the Master's Challenge. Rip is a co-founder of ArborMaster Training, Inc. and ArborGames, and international competitive training series. He is a three-time New England Chapter Jamboree Champion and this is his fourth trip to the ISA finals. He has been climbing for 9 years and in addition to his work as an instructor owns and operates a tree service. Rip competed in the European Congress Jamboree last fall in Versailles, France. Rip believes in giving something back to the profession and after winning the Chapter Jamboree this year in New England, he donated the equipment he won to the local Junior College for use in the arboriculture program. He is an ISA Certified Arborist. Rip also placed second in the Secured Footlock and was fourth overall going into the Master’s.

Mark J. Chisholm
New Jersey Chapter
Aspen Tree Expert Co.
Jackson, NJ
Mark, who finished fifth overall last year at Hilton Head, has been employed in the family business for 12 years. He is a five-time New Jersey Chapter Jamboree Champion and placed third overall at the International Jamboree in 1992. He conducts climbing seminars and is currently producing an instructional video for the NJ-ISA and Committee for the Advancement of Arboriculture. This year, Mark placed first in the Delayed Speed Climb and Throwline, second in the Master’s, and third in the Aerial Rescue.

Dennis Stephen Kalk
Minnesota Chapter
Rainbow Tree Care
St. Louis Park, MN
Dennis has worked in the field for the past 14 years and has 11 years of professional climbing experience. He has competed in the Minnesota Chapter Jamboree 3 of the last 4 years. He placed third in the Master’s, second in the Work Climb and second in the Throwline this year.
Of all the powers affecting people’s lives, few are more profound than competition. It draws us like moths to a flame. It spurs us to achieve higher and higher levels of excellence in performance, techniques and innovation. And it reveals a person’s true nature and character.

The 20th Annual World Tree Climbing Championship showcased the positive attributes of competition. Spectators were treated to an incredible display of talent by the 25 best tree climbers in the world. The climbers were gracious and incredibly giving of themselves, not allowing the intense competition to get in the way of friendships and the exchange of ideas.

This year’s event, held in Cleveland, featured some organizational changes designed to make the competition more equitable to all climbers as well as to provide more crowd appeal. Most notable were the following:

- The Work Climb was changed to a European-style timed event where the climber started in the top of a very large tree.
- The competition culminated in the Masters’ Challenge, a standard Jamboree Work Climb featuring the top five point-getters from the morning’s events.

At the end of the day, there were no losers. Indeed, the winners from this competition extend well beyond a small, elite circle of climbers to everyone in the tree care industry who witnessed the event and was in some way inspired.

For a complete roster of winners, turn the page.

Kay O. Busemann
European Congress Champion
Self-employed
Freiburg, Germany.
Kay has been in the tree care industry for 10 years. He has been self-employed since 1990. In 1992 he began organizing workshops on advanced climbing techniques throughout Europe. He finished first at the European Congress in Versailles in 1995, and was the Germany/Austria Chapter Champion in 1994 and 1995.

This year, he placed first in the Work Climb, Secured Footlock and Aerial Rescue, and fourth in the Master’s. In doing so, he posted the highest overall score.

Robert Gallant
Mid-Atlantic Chapter Champion
Colonial Tree Care
Chesapeake, Virginia
Robert placed second in the ISA All-Around Competition in 1994 and 1995. Bob has eight years of climbing experience and has been competing in Jamborees since 1991. He is a four-time Chapter All-Around Champion. He is safety and training supervisor for his employer and is an ISA Certified Arborist. He placed second in the Aerial Rescue, third in Belayed Speed Climb and Secured Footlock, and fifth in the Master’s.
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<th>STIHL SAW MODEL NO'S.</th>
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<td>160SPEA074</td>
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<td>.325&quot;-PITCH PRO-LITE® BARS</td>
<td>024, 024 Super, 026, 028, 028 Super, 029, 030, 031, 032, 034, 034 Super, 036</td>
<td>22VB</td>
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<td>163SLGD025</td>
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<td>203SLGD025</td>
<td>20&quot;</td>
<td>33.99</td>
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Could it be that the blood, sweat and tears have blurred our vision just enough to keep that picture out of focus? Can we not see enough detail to make it out? Could it be that we need to blink a couple of times to see where we need to stabilize our dreams? Could it be that we have not cleared up our vision at the same time, so we do not see the same picture? It seems so close, yet so far away. It's not a mirage is it? It cannot be, I can see it and almost touch it. Come on it's just over the next hill.

Name and address withheld by request.

Letters should be addressed to:
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PO Box 1094
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Tallahassee, FL
Contact: Gene Dempsey 954-475-4120

October 8-9
S. Illinois University
Annual Vegetation Management for Right-of-Way Workshop, Carbondale, IL
Contact: Sandy Rhoads 618-453-5679

October 9-12
American Society of Consulting Arborists
Annual Meeting
Westin Hotel, Seattle, WA
Contact: 301-947-0483

October 20-22
N.E. Chapter, ISA
Annual Meeting
Ramada Inn, Norwich/Mystic, CT
Contact: Bonnie Moran, 203-746-3014

October 25-27
Texas Assoc. of Landscape Contractors
Southwest Green Industry Expo 96
Arlington Convention Center, Arlington, TX
Contact: 800-832-6934

October 27-30
National Institute of Park and Grounds Management
26th Annual Conference, Radisson South, Minneapolis, MN
Contact: 414-733-2301

November 1-3
New Jersey Shade Tree Federation
Annual Meeting and Tree Expo
Sheraton Inn, Cherry Hill, NJ
Contact: Bill Porter 908-246-3210

November 7-9
TCI EXPO '96
New Charlotte Convention Center
Charlotte, NC
Contact: 800-733-2622

November 12
Maryland Dept. of Natural Resources
Selecting Tree and Plant Stock
Maryland National-Capital Park
Riverdale, MD
Contact: Mike Galvin, 410-535-4737

November 17-21
Green Industry Expo
Cincinnati Convention Center
Cincinnati, OH
Contact: 770-973-2019

November 17-21
Professional Grounds Management Society
85th Annual Conference
Cincinnati, Ohio
Contact: John Gillan 410-584-9754

December 4-6
Rocky Mountain Regional Turfgrass Association
Turf Conference
Currian Hall, Denver, CO
Contact: Julia Marie 719-489-3222

January 8-10, 1997
Eastern Regional Nurserymen's Assoc. Annual Show
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Electricity is an ever-present threat to people in the tree care and line clearance tree trimming industries. All tree workers and employers have a moral obligation to protect themselves and their co-workers from injury. The recent promulgation of two OSHA standards and the attendant publicity they have received seems to have created a certain amount of confusion over who is responsible for what relative to tree work around wires. This is an attempt to set the record straight. Keep in mind that employers as well as employees are required to comply with federal regulations pertaining to tree work around electrical hazards.

If the job places a tree worker, or a conductive object that he is contact with, closer than 10 feet to energized conductors, there are two responsible choices: obtain the necessary qualifications as well as consent of the utility to perform utility line clearance, or contact the utility to see what other options may be available.

Until 1994, line clearance tree trimming was regulated by ANSI Z133 and OSHA's General Duty Clause. The Z133 Standard has long recognized the qualified line clearance tree trimmer and qualified line clearance tree trimmer trainees as workers who possessed special skills and awareness by virtue of their training and experience.

OSHA's Electrical Safety Related Work Practices Standard 29 CFR 1910.331 - 1910.335, became effective December 4, 1990. OSHA enforcement of training started August 6, 1991. It covers residential/commercial tree workers whose work exposes them to the potential hazard of energized electrical conductors. It is a general industry standard; thus, a house painter, a chimney sweep and a residential/commercial tree care service are all governed by 1910.331 because their respective employees may occasionally work near wires.

The Electrical Safety Related Work Practices Standard requires sufficient training to allow the worker to realize when an electrical hazard exists. It further specifies that the non-qualified personnel maintain at least 10 feet of clearance from any energized overhead conductor or conductive object in contact with a conductor.

OSHA's 1910.332, the training section of the general industry standard, states that qualified persons (i.e., those permitted to work on or near exposed energized parts) shall, at a minimum, be trained in and be familiar with the following:

(i) The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment.

(ii) The skills and techniques necessary to determine the nominal voltage of exposed live parts; and,

(iii) The clearance distances specified in 1910.333 © and the corresponding voltages to which the qualified person will be exposed.

Here's one of the tricky parts of understanding OSHA: A worker who is considered "qualified" under the general industry standard is specifically exempt from that standard. Line clearance tree trimmers are, for the purpose of 1910.331, considered qualified. As a result, they are covered by OSHA's Electric Power Generation, Transmission and Distribution Standard, 29 CFR part 1910.269, better known as the Vertical Standard.

The Vertical Standard regulates the utility industry, including line clearance tree trimming. OSHA 1910.269 became effec-
tive on May 31, 1994, except for its training requirements, which were implemented on January 31, 1995. It stipulates that the line clearance tree trimming operation comply with additional requirements outlined in the sidebar below. It subjects line clearance personnel to different minimum separation distances.

**Overview of 1910.269 Requirements for Line Clearance Tree Trimmers**

I. **Training Requirements**

A. Employees must be trained in work practices and safety procedures to perform their everyday operations.

1. Training must be documented
2. Training must be ongoing
3. The employer must determine through regular supervision and inspections that each employee is complying with the requirements of OSHA 1910.269

4. The employee must receive additional training:
   a. If regular inspections reveal employee non-compliance
   b. If new technology, equipment, or changes in work procedures become available
   c. If the worker must use tools or techniques that are different from those normally used.

(1) Such retraining or additional training is required if a skill is not used within one year.

5. Training can be classroom or on-the-job type
6. Training must establish employee proficiency in the work practices involved and shall show employees how to comply with OSHA 1910.269

B. The employer shall certify that each employee has received the training required. Thus, the employee must demonstrate proficiency in the work practices involved and the employer must verify and document the employee’s proficiency.

II. **Medical Services and First Aid**

A. The employer must provide and maintain a well-stocked, approved first aid kit and access to professional medical assistance.

B. Cardiopulmonary resuscitation (CPR)

1. At least two trained persons must be trained in CPR on all crews of two or more employees.
2. Only one trained person need be available if all new employees are trained in first aid and CPR within three months of hire.

III. **Job Briefing**

A. A job briefing must be given to a crew before work begins, outlining:

1. job hazards
2. work procedures involved
3. special precautions
4. energy source controls
5. personal protective equipment requirements

B. A job briefing must be done before each shift.

C. Job briefing must be done more often if:

1. significant changes occur in work operations
2. there are special hazards
3. the worker cannot be expected to recognize and avoid the hazards

IV. **Personal Protective Equipment**

A. Employees must inspect body belts, safety straps, lanyards, ropes, etc. daily.

V. **Mechanical Equipment**

A. There shall be a thorough visual inspection of the elevating and rotating portions of an aerial lift device daily.

B. There shall be no backing vehicles off-road where another employee may be exposed unless:

1. the vehicle has a reverse signal alarm louder than the surrounding noise; or,
2. a spotter signals the driver.

C. All tractors, dozers, etc. must have rollover protective structures.

D. Outriggers must be used, unless the work area precludes their use. In this case, the unit can only be operated within its maximum load ratings without the outriggers.

E. A spotter must watch and warn the lift operator of distance from wire unless the employer can show that bucket operator can accurately determine distances.

F. Chippers must be insulated or detached from the truck if there is a risk of boom contact energizing equipment connected to the truck, or point of potential contact to wire must be insulated.

1. A risk occurs when an un-insulated boom of an aerial lift device could energize a chipper connected to the truck.
2. If an insulated boom is exposed to electrical wires, then the chipper need not be insulated.

VI. **Line Clearance Tree Trimming Operations**

A. The employee must determine the maximum nominal voltage or actual voltage in the lines before climbing a tree.

B. A second line clearance tree trimmer must be within voice communication if:

1. the worker approaches within 10 feet of conductors over 750 volts; or,
2. branches being removed come within 10 feet of conductors over 750 volts; or,
3. roping is necessary.

C. Specified minimum separation distances must be maintained.

D. Wet or contaminated pole pruners cannot be used.

E. Storm work may be done after storm has passed.

OSHA actively enforces the general and vertical standards. If an OSHA inspector sees someone working near electrical conductors, he may observe the operation, ask for credentials, or ask questions to reveal the level of electrical hazards knowledge.

A tree crew with a worker within 10 feet of an electric conductor is considered to be engaged in line clearance tree trimming. This means that even though your employees may not be under contract for line clearance, they must be trained in accordance with 1910.269 if they must work within 10 feet of any overhead energized conductor.

The ANSI Z133 definition of a qualified
The definition of the qualified line clearance tree trimmer trainee is any worker undergoing line-clearance tree trimming training, who, in the course of such training, is familiar with the hazards in line clearance and has demonstrated his or her ability in the performance of the special techniques involved. Such trainees shall be under the direct supervision of qualified line clearance personnel.

Here is another tricky part of understanding the regulations: ANSI Z133 and OSHA 1910.331 use the word “qualified” in reference to a person who possesses the credentials to perform line clearance. OSHA 1910.269 uses that word only in reference to the utility lineman, a worker whose credentials exceed those of a line clearance tree trimmer.

According to 1910.269, the employer must self-certify its employees. Therefore, if the employer can document that appropriate training has been received, the other requirements of 1910.269 are being met, and the employee can demonstrate the ability to safely work around electrical conductors, that employee can be considered qualified under the definition of a line clearance tree trimmer.

OSHA clearly places the burden of proof on the employer, and that is why documentation of work policy, policy enforcement and training are so critical.

How does one obtain the body of knowledge and experience necessary to be a line clearance tree trimmer? Line clearance contractors have amassed that knowledge over time, and can structure training, crew composition and supervision, so that seasoned workers are continuously passing their wisdom to the less experienced.

For the non-line clearance organization, it is more problematic. Training programs such as those offered by the National Arborist Association and ACRT, Inc. fulfill most of the need for training.

As the saying goes, “There is no substitute for experience.”

OSHA has recently proposed some changes to 1910.269. However, none is expected to impact the tree industry. In fact, through the vigilance of tree organizations, the industry has very workable, responsible standards.

Jim Allard is vice president and director of safety for the Asplundh Tree Expert Company, chairman of the ANSI Z133 Committee, and serves on the NAA Board of Directors. Ed Johnson is vice president - Safety & Equipment for the Davey Tree Expert Company, as well as chairman of the NAA Safety Committee and representative to the Z133 Committee.

Is the tree within 10 feet of an overhead line?

NO

Neither 1910.269 nor Subpart S applies.

YES

Is the employer a line clearance tree trimmer?

NO

Subpart S applies. (Employee may not trim branch within 10 feet of line.)

YES

1910.269 applies. (Clearances are specified in 1910.269(r)(1)(iii).)
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Time to Take a New Look at Bracing

By Mark Garvin

Sometimes, trees develop structural weaknesses as they mature, making them susceptible to damage from storms or the weight of their own foliage. Unduly long or fruit-laden branches may require remedial measures, specifically support by cables. The proper use of cables and braces can greatly extend the life of a tree. Compare a brace to the seat belt in your truck. It is a cheap insurance policy against accidents and disasters.

A product recently introduced to the American market by Svensk TradVard of Sweden offers a new approach to saving weak trees. The non-invasive product, known as the Swedish Bracing System, eliminates wounding with supporting hardware while offering faster installation than traditional cabling and bracing. With this new product, installing a brace entails little or no damage to the tree.

The Swedish Bracing System is easy to install. A double 80mm broad webbing sling in a protective sleeve is placed around the stem. Two flat delta rings are brought together on either side of the stem, and a thimble is inserted to hold them together. If there is no suitable side branch or fork to prevent the strap from sliding down the stem, an elastic belt is fastened around the stem to hold the strap in place. If it is not needed, it is removed and the need for adjustment of the bracing strap is greatly reduced.

Either steel cable or Nerex rope (manufactured by New England Ropes, Inc.) is then passed through the thimble and secured. The strap will automatically slip around to face the opposing strap or central ring. Webbing is latex treated to ensure flexibility in low temperatures and is negligibly affected by U.V. light. The small size will encircle a stem of 6 inches in diameter.

The Swedish Bracing System, which is imported and sold by American Arborist Supplies, features a bracing strap that holds a maximum of 10 tons. Nerex bracing rope will support 8 tons and, even with the introduction of a rubber cylinder into the rope, less than one-third of the tensile strength is lost.

The elasticity that is introduced into the rope brings moving branches to a more gentle halt. In addition, with a bracing system now placed high up in the crown, the risk of the top breaking out above the anchor point is virtually eliminated.

Occasionally, even with the best of care, some trees may not withstand nature's forces. A tree may be deteriorated or damaged beyond help from support techniques. The arborist and client must determine if the expenditure of time and money needed to make the tree reasonably safe by adding bracing will be worth the effort. This new system should help sway the decision more often in favor of saving the tree.

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It is common sense that electric wires can be hazardous to anyone doing tree work. OSHA Standard 1910.331 states that only qualified employees can come within ten feet of an overhead energized electrical conductor. Plus, OSHA Standard 1910.269 clearly defines who is legally permitted to work within the ten foot boundary. Finally, ANSI Z133.1 dictates very specific training and operational requirements that all tree care personnel need to follow for safety's sake.

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

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

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[Form for ordering EHAP programs]

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Health Care Help for Small Businesses

A new health care law that will take effect next summer could make it easier for tree care companies struggling to find qualified workers. The Health Insurance Portability and Accountability Act, passed earlier this year by Congress, was signed into law last month by President Clinton.

Starting next year, insurers will be barred from denying coverage for more than 12 months because of an existing condition. Under one provision of the new law, insurers would be required to sell policies to anyone who had employer-based coverage for 18 months and used up COBRA coverage. In addition, employers and insurers won't be able to charge higher premiums or deny coverage to those in poor health.

As a result, employees who are staying at a company for fear of losing health coverage will be able to obtain coverage for pre-existing conditions. This dilemma, known as job lock, is used to describe workers who can't change jobs because they fear an existing illness will make them ineligible for new insurance.

A recent study by the Employers Council on Flexible Compensation found that 41 percent of workers would be more likely to change jobs if concerns over insurance were eliminated. An estimated 21 million Americans now denied coverage for existing conditions would be able to obtain insurance once this legislation takes effect.

Several items in the new bill could make it easier and more affordable for tree care companies to find health insurance. For example, small businesses that have had trouble buying insurance because of their size can no longer be turned down by insurance companies. The law requires insurers to offer policies to companies with as few as two employees.

Another provision allows self-employed workers to deduct even more of their health insurance costs from their income taxes. Currently, 30 percent is deductible. That number rises to 40 percent in 1997; 45 percent in 1998; 50 percent in 2003; 60 percent in 2004; 70 percent in 2005; and 80 percent in 2006.

The law becomes effective on July 1, 1997, although people can begin collecting credit for time worked with an existing condition immediately.

Is It April 15th?

You may want to ask your accountant about amending your business tax return. The new minimum wage law that passed this summer has some retroactive tax breaks that could shave a few dollars off your return. The law restores tax breaks that expired at the end of 1994 for workers who are reimbursed by their employers for educational expenses.

Employers can get refunds for Social Security, Medicare and unemployment taxes they withheld and paid. Workers can get refunds of income taxes, Social Security and Medicare taxes they paid in 1995, as well as Social Security and Medicare taxes already paid this year. Employees may ask employers for refunds, so you might want to ask your accountant for help and advice.

And The Survey Says ...

The Association of Certified Fraud Examiners reports that the annual median loss caused by employee theft for small business is $120,000... New England Business Service found that for businesses less than 3 years old, only 54 percent of owners rely on that business as their primary source of income. That number rises to 77 percent for businesses 3 to 10 years old and to 90 percent for businesses more than 10 years old... Work-related deaths dropped 6 percent during 1995, the Labor Department reports. The leading cause of death on the job was traffic accidents, followed by homicides. Falls account for 10 percent of fatal work injuries.
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Even Routine Jobs Require Extra Care

By Stephen J. Peacock

I sat in my truck finishing my lunch, watching an empty plastic diaper bag blow chaotically around in the avenue before me. We had endured rain showers for days, and a strong wind was gusting before the next imminent downpour. It was time to take that sorry Siberian elm tree down.

We took inventory of the gear needed for the task and off-loaded the truck. I saddled up and put my chaps and spurs on, had the O20T gassed and oiled. Jason asked how long it would take me to get the tree down. I replied, “An hour and a half, max.” It was a routine removal, similar to hundreds I had done in my 19-year career.

I wouldn’t have been doing this if my foreman hadn’t quit eight days earlier. I never liked wearing climbing spurs, but it seemed the easiest way to climb this wet tree.

The tree forked into two leaders at 4 1/2 feet, and I decided that the best leader to work from was to my left. I hooked in and started on my way up the tree. At 8 feet, grew three regrowth suckers, which I promptly cut flush to the trunk with my hand saw.

This was a property line tree and the neighbor had taken the liberty of cutting limbs off exactly at the line, leaving 4- and 5-inch dead stubs. I pounded on these as [ascended the tree and not one budged. I approached the next main fork at about 20 feet. More stubs existed where someone had previously mutilated the tree.

“I’ll just test these stubs the same as the others,” I thought to myself. With a sharp rap from the heel of my hand, the stub flew right out of the tree with absolutely no resistance.

I had not secured myself with my safety line, so I lost my balance. I remember thinking that I would simply grab the tree in front of me, but somehow it was no longer in front of me. Instead, I spun on my gaffs and was headed out of the tree. In that moment, I saw a lateral that was within my reach. I managed only to grasp it momentarily, just long enough to straighten me out as I shot directly to the ground like a butt-heavy limb. The ground and I were in contact much more quickly than I had anticipated. That concrete driveway was awfully hard.

I am a lucky man. I only fractured my right heel, which is now equipped with nine screws and a plate to hold it all together. I’ll be back in the trees soon enough I hope, and when I am you can bet I’ll be tied in at all times—no matter how routine and familiar the task. This experience proved to me that whatever your seasoning and skill level, accidents can and will happen if safety is not number one! Be tied in at all times!

Stephen J. Peacock is owner of Peacock Tree Preservation of Portland, OR.
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J.J. Mauget Company
J.P. Carlton Company, Div. DAF, Inc.
Jameson Corporation
John Bean Sprayers
Kan-Du Stumpers
Karl Kuemerling, Inc.
Kraft Power
Lanphere Supply
Lawn & Landscape
Leonard Teeth
Miller Machine Works
Minnesota Wanner Company
Monsanto
Monterey Lawn & Garden Products, Inc.
Morbark E-Z Beaver Sales Company
National Arborist Association (NAA)
National Arborist Foundation (NAF)
New England Ropes, Inc.
Niemeyer Corporation
North American Engine Co. (NAECO)
Northeastern Associates
Nu-Arbor Tree & Shrub Care Products, Inc.
Omni Leasing, Inc.
Opdyke, Inc.
Oral Ivy, Inc.
Oregon Cutting Systems, Div. Blount, Inc.
Outdoor Wood Heating Co.
The Peavey Manufacturing Company
Plant Health Care, Inc.
Poinsettia Software
Polecat Industries, Inc.
Poulan Weed-Eater
Power Great Lakes, Inc.
Practical Solutions, Inc.
Preformed Line Products
R.E. Chapin Manufacturing Works
Rayco Manufacturing, Inc.
RISE
Roots, Inc.
Safety Test & Equipment Company
Salsco, Inc.
SawTree
Schodorf Truck Body & Equip. Company
Sherrill Arborist Equipment & Supply
Shindaiwa, Inc.
Sierra Moreno Mercantile Company
Simon-Telelect, Inc.
Simonds Industries, Inc.
Southco Industries, Inc.
Southern Chapter, ISA
STIHL Incorporated
Sunbelt Outdoor Products, Inc.
SwapLoader, USA Ltd./ An EFCO Company
Takagi Tools, Inc.
Tanaka
TECO, Inc.
Tilton Equipment Company
Time Manufacturing Company
The Toro Company
TrafFix Devices, Inc.
TREE CARE INDUSTRY (TCI)
Tree Climbers International
Tree Line Supply Company
Tree Management Systems, Inc.
Tree Tech Microinjection Systems
USFS/Civilian Conservation Center/Job Corps
Vermeer Manufacturing Company
Wall Safety Products/Div. Wall Industries
Weaver Leather, Inc.
Wellington Leisure Products
WesSpur, Inc.
Westheller Company, Inc.
Who Cares? Watches & T-Shirts
Wis-Con Total Power Corporation
Wood/Chuck Chipper Corporation
Yale Cordage, Inc.
Thursday, November 7, 1996

7:30am REGISTRATION OPENS
Complimentary refreshments available.

8:30 to 9:45am KEYNOTE ADDRESS: TREE CARE IN THE 21ST CENTURY - Dr. Alex Shigo
Complimentary coffee available
Renowned tree biologist Dr. Alex Shigo paints a surprising and thorough portrait of the professional arborist of the next millennium. We'll all need his insight into tree anatomy and physiology to provide proper tree care in the 21st Century... and it won't hurt your business now either!

9:57am TRADE SHOW OPENS
Wear your walking shoes because with over 150 exhibitors there will be a lot of ground to cover! TCI EXPO is the largest tree care trade show in the nation. If it will make your business more efficient, competitive, productive or profitable, you'll find it all right here.
Plus, we've arranged for plenty of exciting demonstrations ranging from climbing and rigging to electrical hazard training. Check your show program for times and locations. To keep up with the industry, you won't want to miss a single demo.

12:00 Noon ARBORBUCKS DRAWING, DEMONSTRATION AREA.
Be sure to fill out your entry form and you could be the winner of $500 in ARBORBUCKS currency.
ARBORBUCKS can be used as cash at any of the participating vendor booths. Here's your chance to win the goods and services you need, and the exhibitors pick up the tab!

4 to 5:00pm DEVELOPING TRAINING & EDUCATIONAL TOOLS FOR HISPANIC WORKERS - Tina Terrell
If you have tried recruiting lately, you know how hard it is to find and retain good employees. Yet here's a largely untapped pool of potential recruits just waiting for you. This lecture will give you the inside scoop on how to structure training and plan an employee development process that will open up a new resource for you and your company.

7:30am REGISTRATION OPENS
Complimentary refreshments available.

8 to 9:15am HOW INSECTS KILL TREES - Jim McGraw
Complimentary coffee available
Jim McGraw is an Extension Forestry and Pest Management Specialist with the state of North Carolina. Here, Jim will give you an up close and personal look at common and serious tree insect pests.

8 to 9:15am COMMUNICATING IS JOB #1 - Daniel J. Canary
Complimentary coffee available
Maybe it's not what you say, but how you say it. Clear communication is an absolute necessity for customer satisfaction... and employee productivity, too. Dr. Canary, part of the Communication Research Associates consulting firm, will give you several easy steps to clarify your message.

9:00am TRADE SHOW OPENS
Plan on an information-packed day of demonstrations, browsing the newest equipment, technologies and services, and rubbing shoulders (and exchanging ideas) with your peers. There's no other show like TCI EXPO!

9:15 to 9:30am COFFEE BREAK OUTSIDE MEETING ROOMS

9:30 to 10:30am STRATEGIES FOR REDUCING SOIL COMPACTION - Tom Smiley
Take advantage of Tom's experience in applied research at F.A. Bartlett Tree Expert Company to learn more about the effect of soil compaction on trees, and what to do about it. It could be a new profit center for you!

9:30 to 10:30am HOW TO LAND COMMERCIAL CLIENTS - Phil Nilsson
Nilsson takes aim at marketing, estimating, proposals and other skills you need to land big commercial contracts. Nilsson, author and consultant to the green industry, uses his diverse background and experience to show you the way to growth and profits!

12:00 Noon ARBORBUCKS DRAWING, DEMONSTRATION AREA
It's not too late to enter the drawing! The name they call could be yours!

12:00 Noon ARBORBUCKS DRAWING, DEMONSTRATION AREA
It's too late to enter the drawing! The name they call could be yours!

4 to 5:00pm TREATING THE WHOLE TREE - Bruce Fraedrich
F.A. Bartlett Tree Expert Company knows how to treat the whole tree because of Mr. Fraedrich's applied research in this area. Now you can find out what the "big guys" know about how this wholistic approach can benefit trees and your bottom line.

4 to 5:00pm TRADING THE WHOLE TREE - Bruce Fraedrich
F.A. Bartlett Tree Expert Company knows how to treat the whole tree because of Mr. Fraedrich's applied research in this area. Now you can find out what the "big guys" know about how this wholistic approach can benefit trees and your bottom line.

4 to 6:00pm TREASURING THE WHOLE TREE - Bruce Fraedrich
F.A. Bartlett Tree Expert Company knows how to treat the whole tree because of Mr. Fraedrich's applied research in this area. Now you can find out what the "big guys" know about how this wholistic approach can benefit trees and your bottom line.

6 to 8:00pm WELCOME RECEPTION FOR ALL ATTENDEES AND EXHIBITORS
Piedmont Ballroom, Westin Hotel, Charlotte.
Complimentary hors d'oeuvres, beer, wine and soda.
Catch up with old friends, make some new ones, network, ask questions and enjoy an evening of fun with fellow tree care professionals.
5:15 to 6:00pm  LOOK SHARP!!  
Ezio Leonard, Jr. and Ray Eluskie
This evening session is FREE for NAA Members and their invited guests and offers insight into stump tooth/chipper knife care & maintenance.

Saturday, November 9, 1996
7:30am  REGISTRATION OPENS  
Complimentary refreshments available
8 to 9:00am  PRESCRIPTIONS FOR TREE HEALTH - Ron Jones
Here's some strong medicine for your business. North Carolina State Plant Pathologist Ron Jones shares his insight and experience in mitigation and control strategies for significant tree diseases.

8 to 9:00am  EFFECTIVE USE OF COMPUTERS IN TREE CARE (PART 1) - Panel: Marie Franke, Practical Solutions, Inc.; Mark Smith, Arbormasters; Donna Garner, Tree Management Systems; and Peter Hannan, Arbor Computer Systems
They're everywhere—in the news, on the rise, and maybe on your competitors' desk! If you're not already computer literate, let us show you how to automate your accounting, whip out your work orders, and jazz up your job costing. This seminar is geared toward the SMART MANAGER, but has plenty to offer the EXPERT PRACTITIONER.

9:00am  TRADE SHOW OPENS  
This is your last day to see and learn about everything you need to keep your business moving! Be sure to take advantage of all TCI EXPO '96 has to offer!

9:15 to 10:30am  LOOKING AHEAD: IMPLEMENTING A FIVE YEAR PLAN - Kevin Kehoe
Complimentary coffee available
Is business a game? It is to Kehoe who uses a board game approach to showing you how to build your business. Move ahead three, take a risk card, move back two spaces. Is success a roll of the dice? Not if you attend this exciting seminar. Learn what it takes to move your business ahead successfully and smoothly.

9:15 to 10:30am  EFFECTIVE USE OF COMPUTERS IN TREE CARE (PART II) - Panel: Maris Franke, Practical Solutions, Inc.; Mark Smith, Arbormasters; Donna Garner, Tree Management Systems; and Peter Hannan, Arbor Computer Systems
Complimentary coffee available
There's too much ground to cover in one computer seminar. Don't miss part 2 - this is one sequel that's just as good as the original. You'll get a look at the future of tree care computing with industry-specific functions such as maintaining tree histories, inventories and mapping. Geared toward the EXPERT PRACTITIONER but has plenty to offer the SMART MANAGER.

12:00 Noon  ARBORBUCKS DRAWING, DEMONSTRATION AREA
Last chance to win $500 in products and services. See you in the demo area!

1:pm to 4:30pm  ISA CERTIFICATION EXAM - To pre-register for the exam, you must call Beth Crozier at ISA, at 217-355-9411. All participants must be pre-registered.

3:00pm  TCI EXPO '96 TRADE SHOW CLOSES!!

See you next year in Columbus, OH!!
How do I get there?

Driving is easy...

FROM I-85:
Driving North from points South of Charlotte:
Exit 36 to Brookshire Freeway, Highway 16 South until it turns into I-277 loop. Continue on I-277 loop around city to Exit 1E, Stonewall Street.
To the Westin: Turn left on Stonewall and proceed 3 blocks to College Street and turn right. Turn right on 3rd Street and right into the Westin Motor Lobby.
To the Holiday Inn: Turn left on Stonewall and proceed 3 blocks to College Street and turn right. Proceed on College Street for 6 blocks. Turn right into hotel on 6th Street.

Driving South from points North of Charlotte:
Exit 38, which is I-77 South, to Exit 1E, Stonewall Street. Follow from above.
FROM I-77:
Driving South from points North of Charlotte:
Exit 9 to I-277 (also known as Brookshire Freeway) Continue on loop to 1E, Stonewall Street.
To the Westin: Turn left on Stonewall and proceed 3 blocks to College Street and turn right. Proceed on College Street for 6 blocks. Turn right into hotel on 6th Street.

Driving North from points South of Charlotte:
Exit 9 on I-277 (also known as John Belk Freeway) Continue on loop to Exit 1E, College Street.
To the Westin: Turn left on Stonewall and proceed 3 blocks to College Street and turn right. Proceed on College Street for 6 blocks. Turn right into hotel on 6th Street.

FROM US HIGHWAY 74
Driving West from points East of Charlotte:
Follow signs to I-277 West (John Belk Freeway). Continue to Exit 1E, Stonewall Street.
To the Westin: Turn left on Stonewall and proceed 3 blocks to College Street and turn right. Turn right on 3rd Street and right into the Westin Motor Lobby.
To the Holiday Inn: Turn left on Stonewall and proceed 3 blocks to College Street and turn right. Proceed on College Street for 6 blocks. Turn right into hotel on 6th Street.

Driving East from points West of Charlotte:
Continue on US 74 until it merges with I-277. Exit 1E, College Street.
To the Westin: Proceed on College Street and turn right onto 3rd Street and right into the Westin Motor Lobby.
To the Holiday Inn: Continue on College Street for 6 blocks. Turn right into the Holiday Inn on 6th Street.

Limited parking is available at the convention center and at local public parking lots. Daily rates range from $3.75 to $6.00. Limited complimentary parking is available for those guests registered at the Holiday Inn Charlotte. Guests of the Westin Hotel Charlotte will pay a daily rate of $10.00 self-park or $14.00 valet park.

Flying is easy...

Charlotte, NC is a USAir hub and is easily accessible by air from all major cities. USAir is the official airline for TCI EXPO ’96 and will offer conference attendees 5% off its lowest published fares to Charlotte and 10% off its unrestricted fares.

Charlotte/Douglas International Airport is located 15 minutes from Uptown Charlotte. Arrangements have been made with Gray Line transportation to provide service to the Uptown hotels for TCI EXPO attendees. Gray Line pick-up is located just outside the baggage claim area and will offer a discounted rate of $13.00 round trip or $7.00 one way. To receive this discount, look for Gray Line coupons in your registration confirmation packages.

Finding a hotel room is easy...

This year, the host hotel for TCI EXPO ’96 will be the Westin Hotel Charlotte, located just across the street from the Convention Center at 222 East Third Street. The Westin Hotel Charlotte was formerly called the Omni Charlotte. The Westin is offering TCI EXPO ’96 attendees the rate of $91.00 single/double occupancy. Space is limited so be sure to make your reservations early. This rate will be offered until October 5, 1996. To make your reservation, please call the Westin Hotel direct at 704-377-1500 or call the Westin Central Reservation line at 1-800-228-3000. Be sure to reference the National Arborist Association/TCI EXPO room block when making your reservation.

 Halifax accommodations are available at the Holiday Inn located 5 blocks from the Convention Center. The address for the Holiday Inn is 230 North College Street, Charlotte, NC 28202. The Holiday Inn will offer TCI EXPO ’96 attendees the rate of $69.00 single/double occupancy with limited complimentary parking. Reservations must be made prior to October 5, 1996 to guarantee this preferred rate. To reserve your room, please call the hotel direct at 704-335-5400 and be sure to reference the National Arborist Association/TCI room block.

MAKE YOUR RESERVATIONS EARLY!

The “Uptown Circuit” runs throughout the Uptown Charlotte area and can provide shuttle service to the Convention Center from the Holiday Inn. This is a complimentary service provided by the City of Charlotte. The electric shuttle is a 20 passenger bus that runs Monday through Friday from 7:30am to 6:00pm.

Uptown Charlotte offers numerous restaurants, galleries, historical sites and museums, shops and city tours, most within walking distance of the hotels and convention center.

For any questions on the city of Charlotte, dining recommendations, transportation or sight seeing, be sure to visit the Charlotte Welcome & Information Center located next to the registration desk in the College Street Lobby.

Trade Show Hours:
Thursday, November 7 - 9:57am to 5:00pm • Friday, November 8 - 9:00am to 5:00pm • Saturday, November 9 - 9:00am to 3:00pm
### Registration Form

**Name:**

**Company:**

**Address:**

**City:**

**State:**

**Zip:**

**Title:** (please check one that applies)

- Owner
- President
- Vice President
- Manager (general)
- Superintendent
- Forester
- Supervisor
- Director
- Purchasing Agent
- Landscaper
- Grounds Manager
- Govt. Agent
- Consultant
- Instructor
- Arborist
- Other

**Signature:**

**NAA Member?**

- Yes
- No

**NOTE:** Please use separate forms for each attendee. This form may be photocopied.

### Seminars

Check the box beside each seminar you wish to attend. **Be careful not to pick two seminars that are held at the same time.**

Count the number of seminar hours indicated next to the seminar titles. Record this number in the space below labeled **total seminar hours.**

**NOTE:** Evening Sessions on Thursday, November 7 and Friday, November 8 are available only to NAA Members and their guests—and they’re FREE!!

<table>
<thead>
<tr>
<th>Date</th>
<th>Seminar Title</th>
<th>Seminar Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>THURSDAY, NOVEMBER 7</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#1 - 8:30 am</td>
<td>Tree Care in the 21st Century</td>
<td>1 hour</td>
</tr>
<tr>
<td>#2 - 4:00 pm</td>
<td>Developing Training and Educational Tools for Hispanic Workers</td>
<td>1 hour</td>
</tr>
<tr>
<td>#3 - 4:00 pm</td>
<td>A300: A New Era of Understanding</td>
<td>1 hour</td>
</tr>
<tr>
<td>Evening Session 5:15 pm</td>
<td>How to Win the Excellence in Arboriculture Award (Open only to NAA Members and their Guests)</td>
<td>0 hour</td>
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<tr>
<td><strong>FRIDAY, NOVEMBER 8</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#4 - 8:00 am</td>
<td>How Insects Kill Trees</td>
<td>0 hour</td>
</tr>
<tr>
<td>#5 - 8:00 am</td>
<td>Communicating is Job #1</td>
<td>1 hour</td>
</tr>
<tr>
<td>#6 - 9:30 am</td>
<td>How to Land Commercial Clients</td>
<td>1 hour</td>
</tr>
<tr>
<td>#7 - 9:30 am</td>
<td>Strategies for Reducing Soil Compaction</td>
<td>1 hour</td>
</tr>
<tr>
<td>#8 - 4:00 pm</td>
<td>Treating the Whole Tree</td>
<td>1 hour</td>
</tr>
<tr>
<td>#9 - 4:00 pm</td>
<td>Fleet Safety</td>
<td>1 hour</td>
</tr>
<tr>
<td>Evening Session 5:15 pm</td>
<td>Stump Tooth/Chipper Knife Care &amp; Maintenance (Open only to NAA Members and their Guests)</td>
<td>0 hour</td>
</tr>
<tr>
<td><strong>SATURDAY, NOVEMBER 9</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#10 - 8:00 am</td>
<td>Prescriptions for Tree Health</td>
<td>0 hour</td>
</tr>
<tr>
<td>#11 - 8:00 am</td>
<td>Effective Use of Computers in Tree Care - Part I</td>
<td>1 hour</td>
</tr>
<tr>
<td>#12 - 9:15 am</td>
<td>Looking Ahead: Implementing a Five-Year Plan</td>
<td>1 hour</td>
</tr>
<tr>
<td>#13 - 9:15 am</td>
<td>Effective Use of Computers in Tree Care - Part II</td>
<td>1 hour</td>
</tr>
</tbody>
</table>

**TOTAL SEMINAR HOURS**

### Calculate Your Cost

**BASIC COSTS:** Multiply your total seminar hours by $38 and enter the amount on the basic cost line.

**DISCOUNTS:** Deduct $3 per seminar hour if you are registering prior to the **Early Bird Deadline, October 10, 1996.** Deduct $6 per seminar hour if you are registering an additional person from your organization. (Discounts available to each registrant.)

**TOTAL COST:** Subtract your Total Discount from your Basic Cost line. This figure is what you pay for your registration.

### The Gold Card

If your Total Cost Line is greater than $170 AND you register prior to the **Early Bird Deadline of October 10,** then **BUY GOLD!**

To purchase the GOLD CARD which will give you unrestricted access to all educational sessions, check **YES** in the box below and enter $170 in the **TOTAL COST LINE** and you’re done!

I wish to buy a Gold Card registration:

- Yes
- No

### Payment Information

- Check enclosed for $____________________
- Please charge my Visa/MasterCard Card # ________________________
- Expiration Date ________________________
- Signature ________________________

**Do you wish to receive NAA Membership Info?**

- Yes
- No

**Do you wish to receive a 12 month complimentary subscription to TCI Magazine?**

- Yes
- No

You must complete all of the information below to receive your subscription:

- **Business/Industry:** (please check one that applies)
  - Tree Service
  - Landscape Contractor
  - Governmental Entity
  - Property Mgmt.
  - Consulting Firm
  - Utility
  - School/University
  - Other:

  **Purchasing Authority:** (please check one that applies)

  - Approve
  - Recommend

**3 Easy Ways to Register!!!**

- **By Phone:** Call 800-733-2622 and have your credit card # ready
- **By Fax:** Send Completed Registration Form to TCI EXPO '96 at 603-672-2613
- **By Mail:** Send Completed Registration Form to TCI EXPO '96, P.O. Box 1094, Amherst, NH 03031-1094

**BE SURE TO INCLUDE YOUR PAYMENT INFORMATION.**
New Features.....

The Doctor is IN
with Dr. Alex Shigo

Dr. Alex Shigo will be on hand during the show to perform an autopsy on your wood sample. The Doctor is available by appointment only, so be sure to schedule your time by calling the NAA office at 1-800-733-2622. Bring your wood sample and a marker to take home your autographed piece.

NAA Member Seminars

The benefits of NAA Membership are everywhere. This year, NAA members are invited to attend 2 FREE seminars on Thursday and Friday from 5:15pm to 6:00pm. Bring a co-worker—bring a guest. Hear how the NAA can help you achieve your goals!!

ISA RECERTIFICATION EXAM

The ISA Recertification Exam will be given on Saturday, November 9, 1996 from 1:00 to 4:30pm. You must be pre-registered with ISA to participate. To pre-register for the exam or to obtain additional information, be sure to call ISA at 217-355-9411.

Checklist For Registration Form

- Photocopied the original form to give to additional members of my firm
- Filled out the form completely
- Taken advantage of all entitled discounts
- Double checked all cost calculations
- Photocopied the completed form for my records
- If there are multiple attendees from my company, enclosed a copy of their form(s)
- Enclosed a check or credit card information
- Mailed or faxed registration form before October 10, 1996